The IRON AGE

October 3, 1957 A Chilton Publication The National Metalworking Weekly

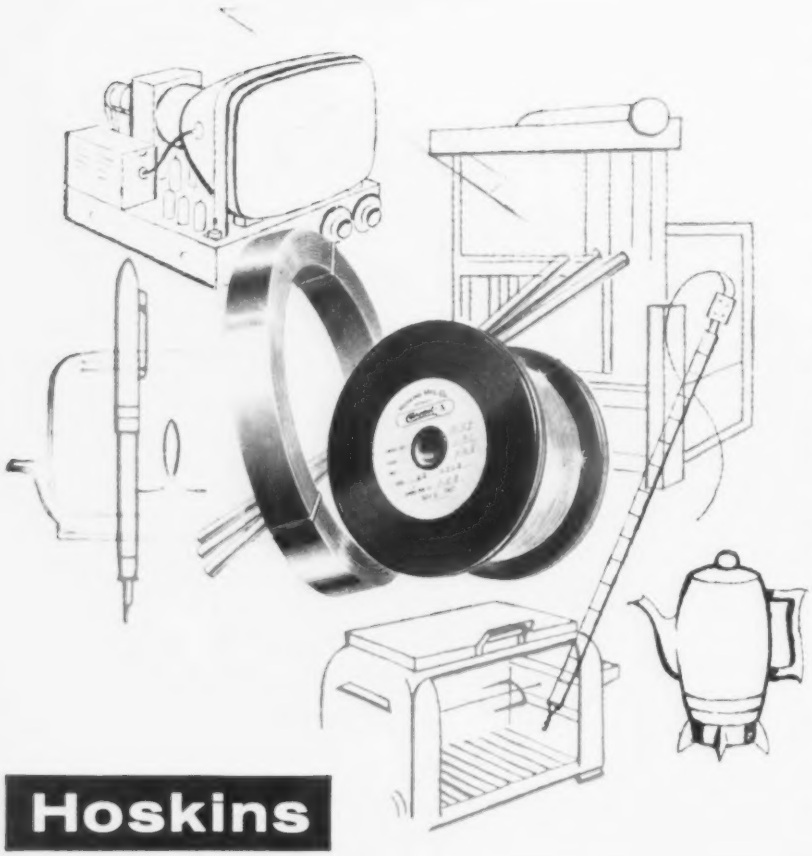
Dana Corp.'s J. E. Martin

Diversification: Is It Always The Answer ? P. 53

Drive Costs Down On Short-Run Stampings – P. 93

Behind the Drop In Steel Scrap Prices – P. 132

Digest of the Week P. 2-3



Hoskins

ALLOY 815-R: A new iron-chromium-aluminum alloy developed especially for use on precision resistor applications. Possesses high resistivity and low temperature coefficient of resistance, plus high strength, excellent ductility, and stability over a wide temperature range.

CHROMEL-C: A 60-16 nickel-chromium-iron alloy widely used in small heating appliances and cold resistors where high resistances are required within limited space. Its stability and uniformity minimize design variables, permit more efficient production of better units at lower cost.

CHROMEL-ALUMEL: The most accurate and most durable base metal thermocouple alloys ever developed. Made exclusively by Hoskins, they are the accepted standards for controlling heat treating operations up to 2300°F. and for measuring temperatures of jet aircraft engines.

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When it comes to developing and producing custom quality alloys for electrical resistance, thermo-electric, and specialized mechanical purpose applications, you'll find that Hoskins has what it takes to meet your most critical requirements. Complete metallurgical research and development facilities, for one thing. Modern melting and processing equipment, for another. More important, though, is an abundance of human talent . . . people who have the experience, the know-how, and a sincere desire to deliver exactly what you want when and where you want it. *Try them and see!*

Life in a Vacuum—The special vacuum atmosphere life-test equipment shown above was designed and built by Hoskins for use in developing new heating element alloys which will give improved performance and dependable, long-life service in vacuum atmosphere heat treating equipment.

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How steel sheets help cut summertime labor

A scant decade ago power mowers were a comparative novelty on the lawns of Suburbia. Yet nowadays it's a rare homeowner who does *not* trim his grass with the time-saving assistance of power!

Yes, the power lawn-mower is another newcomer which takes a swelling tonnage of steel sheets for its construction. The deck of the mower shown here, for example, was made from Bethlehem cold-rolled sheet for rugged strength without unwanted weight. And the handles of most lawn-mowers now are sturdy, light-weight tubular members formed from strong sheet steel.

There are so many of these relatively new sheet-steel applications today! When you consider them, together with the continuing—and growing—needs of other, long-time users of sheets, it's no wonder sheet supplies have been so tight these past few years.

Bethlehem sheet mills at Sparrows Point and Lackawanna have been working hard to keep up with the demand. Now there's reason to believe that we are coming abreast of it. In brief, we welcome your inquiry.

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Indexed in the Industrial Arts Index and the Engineering Index.

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The IRON AGE

October 3, 1957—Vol. 180, No. 14

Digest of the Week in

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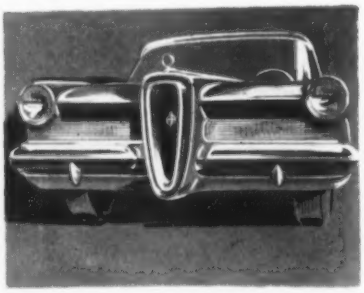
Plenty of Advice — President's Conference for Small Business is aimed at starting a broad program of regional conferences. Idea is to help small businesses use sources now available. But many would prefer concrete help in the form of tax cuts. P. 58

THE NEW EDSEL

Behind the Scenes—How much work and planning went into Ford's



new Edsel? A behind-the-scenes look indicates the long hours of planning and sweating that created this newest of the new cars. P. 60

TRUCK LEASING

It Has Advantages—Even using soft-sell tactics, truck lessors are having no trouble finding customers. Some smaller firms find they can ship for less than common carrier truck rates. P. 62

1958 AUTOS

A Look At Chrysler — Styling

Metalworking

changes in the 1958 Chrysler line will be relatively minor. Not so with mechanical innovations. The list begins with a new, lighter engine and an optional fuel injection system. P. 70

MACHINE TOOL SALES

Distributors Push Them — Declines in machine tool sales and shipments got attention at AMTDA annual meeting. Ideas and suggestions to spur buying were an important item on the agenda. P. 78

FEATURE ARTICLES

SHORT RUN STAMPING

New Method Cuts Cost—Instead of trying to save by eliminating production steps, a patented method actually adds steps. Production costs are higher, but it's done with dies that run only 10 to 15 pct of the cost of conventional dies. P. 93

VACUUM ARC FURNACES

There are five keys to success in choosing vacuum arc melting equipment: Ingot size; electrode size and formation; the vacuum system; the power supply; and safety, handling, and housing aspects. Omitting any one of them could result in equipment that won't fit your needs. P. 96

CLEAN PLANT AIR

With Electronics — As dust atoms flow into the electronic air cleaner they pass through a high-voltage electrostatic field. Charged particles are collected and washed away. It's not a new idea, but the cost is coming within reach. P. 100

EASE MODEL CHANGES

With Pretesting Team—By creating an independent activity to check out assembly techniques, an automotive company eliminates many of the headaches that go with a model changeover. P. 102

CHECK GUNDRILL EDGES

With Sight Gage—Instead of using costly or elaborate instruments for checking sharpening accuracy, a simple shop-made sight gage does the job. It takes a gage for each drill diameter, made in a few simple steps from screw stock. P. 106

MARKETS & PRICES

OXYGEN

Make or Buy—Steel companies disclose some of their figures on the costs of producing oxygen for steelmaking operations. J & L and Inland analyze operating costs and decision of making or buying. P. 57

◀

GROWTH PLAN: Dana Corp.'s President J. E. Martin has some definite opinions on the best approach to take for long-range company growth. There are a number of ways a firm can expand, he says. But to do it right you must have planning. P. 53

EXPORT MANEUVER

Produce Right At Market — A way around such export headaches as tariffs, import quotas, high labor costs has been found by Rockwell Mfg. Co. The firm bought an existing plant in West Germany to produce right in the European market area. P. 56

CONSUMER BUYING

Unexpected Upturn—A sudden spurt in retail sales and home building is putting new life into many businesses. Unaccountably, retail sales are about 7 pct ahead of a year ago. Some plants are increasing their production rate. P. 75

A SLOW PICKUP

At a Snail's Pace—The fall pickup in steel demand is slower than expected. Mills are selling on quick delivery; buyers choosy. P.131

SCRAP PRICES

Why They Collapsed — The sharp drop in the scrap market was touched off by lower-than-expected bids on automotive lists. Now the trade is wondering how it missed anticipating the bust. P. 132

NEXT WEEK

PURCHASING TALENT

Get the Most From It—Sound buying is as important to the company's profit picture as sound selling. Next week's Special Report discusses how management can get maximum benefit from purchasers and their staffs.

SMALL PARTS

In a Production Tangle?—It's poor economy to tie up a major tool with a few tiny jobs while the big ones wait their turn. Next week's technical feature will show how Douglas Aircraft saved money with a special shop for small parts only.

STAINLESS STEELS AND CORROSION RESISTANCE

The best stainless steel tubing for a specific application cannot be identified by surface appearance alone. The answer is found in the grain structure because the corrosion resistance of any given grade of stainless steel depends on heat treatment.

And constant testing is the only way to prove a material's ability to beat the many different types of corrosive attack . . . as B&W men like Mike Landman, who checks corrosion resistance of B&W Stainless Tubing, know. And the entire team of B&W technicians—inspectors, furnace operators, metallurgists, engineers and chemists—know that constant checking is an integral part of the complete production cycle.

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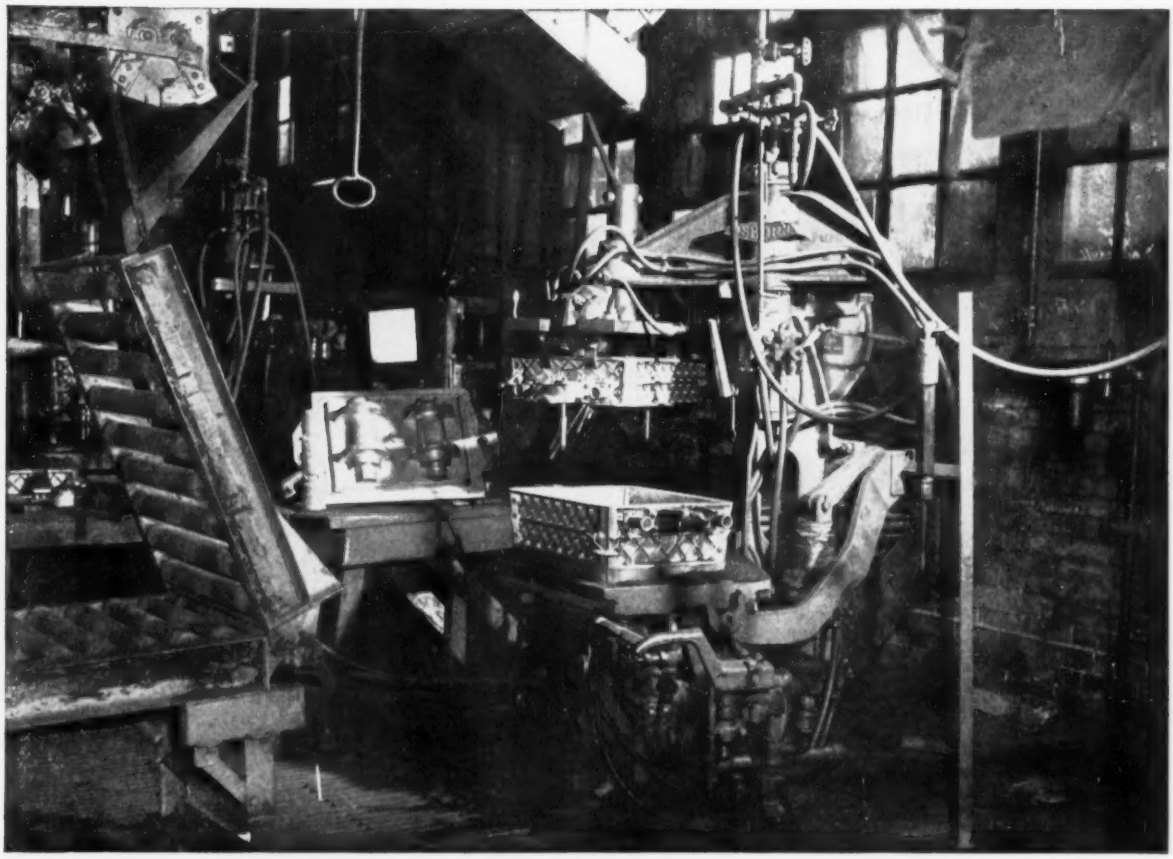

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Pull Up Your Socks
It May Get a Little Sloppy!

In this stage of the game, at least, the order-taker is out the window. Either he was tossed out or he jumped out.

New business isn't coming in over the transom. It hasn't for some time. Some of the oldtimers are getting a thinly-disguised glint in their eyes. It looks suspiciously like "I told you so." But this isn't the time for wakes or post-mortems.

The boys who are booking business today are the ones who are going out after it. Shortages are pretty much over. Today you work for what you sell.

To many sales organizations the words "hard work" are just figures of speech. Some people think they know what work means, but they have never met up with it.

There isn't any simple sales approach in the tough market we have today—one which will be with us for a spell. To be brutal, what we are in for now is "normalcy."

All of us have heard the pitch on the hard sell, the soft sell, the quiet sell. We know that the salesmanager must be tough, kind, considerate, a stinker—and able to outsell his best salesman. But there may be a lot of things we don't know or aren't willing to face.

Every day millions of people take tranquilizers because they think they can't face things. Maybe we use the phrase "the best we can" as a tranquilizer when the "best" is none too good.

It is time for sales inventory-taking. To wait too long may mean too great a distance between us and our competitors. Have we the right man in the right place at the right time? Do we and our people practice self-discipline, instead of just preaching it?

Is there loyalty to company and product that produces a dedicated approach to all sales opportunities? Is the sales song sung down from the top and up from the bottom?

Are we aware that we can't always have pie in the sky but at the same time refrain from using that knowledge as an excuse for not selling?

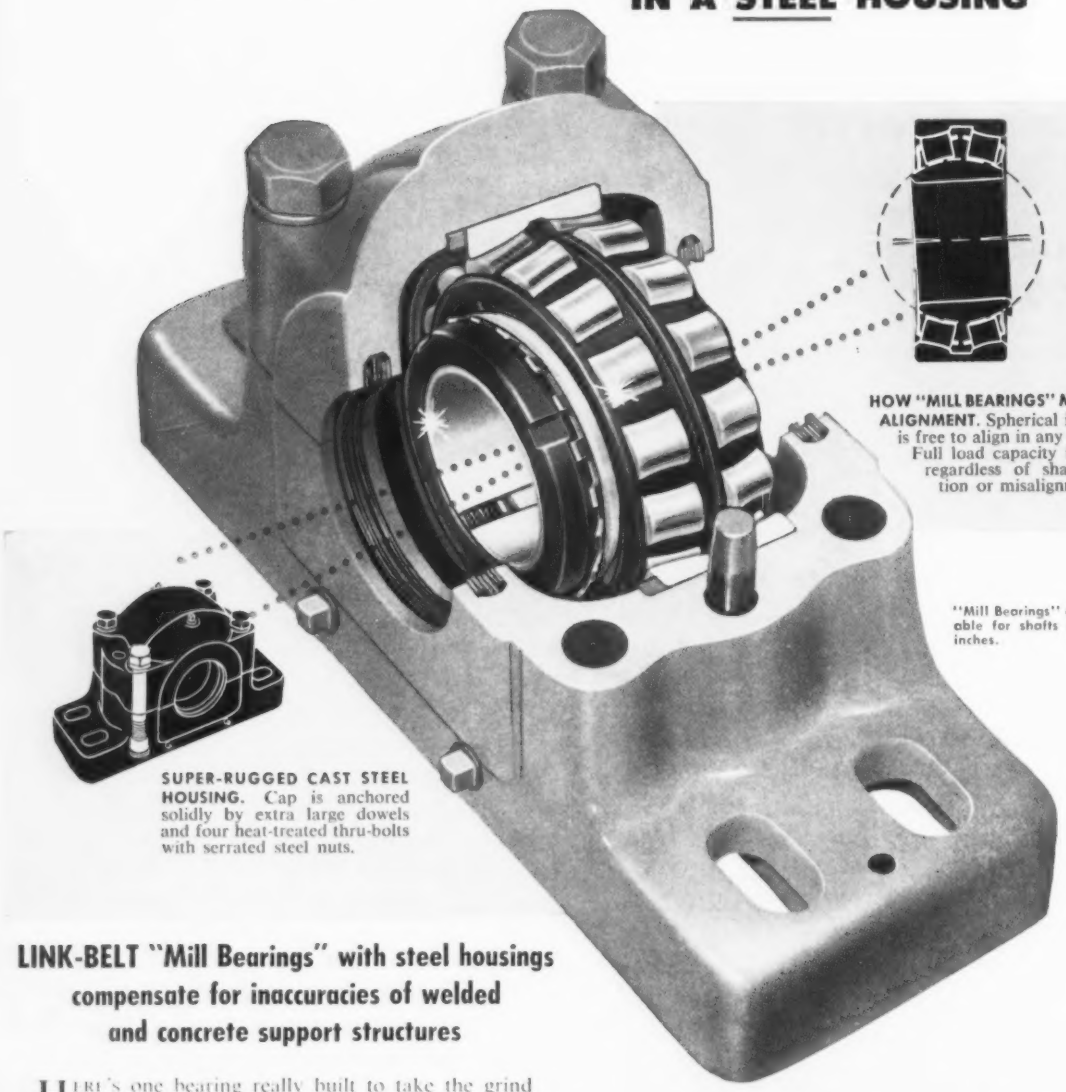
Would we rather sell than eat? Would we rather sell than sleep? Is this our mission? If not, then we better get into another job because there isn't room any more for those who can't sell with the zeal of a man with a message.

Tom Campbell

Editor-in-Chief

HERE'S self-alignment

IN A STEEL HOUSING



HOW "MILL BEARINGS" MAINTAIN ALIGNMENT. Spherical inner ring is free to align in any direction. Full load capacity is assured regardless of shaft deflection or misalignment.

"Mill Bearings" are available for shafts up to 11 inches.

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Person to Person

Sir—Your Survey Report on "How to Build Good Communications" is one I'd like to get some reprints of if they're still available. Five copies would do fine.

Too bad that this type of report gets the usual "Yes, we know all about this," then is forgotten in the day to day routine of doing a job plowing through the very thing that is being ignored: communications.

Misuse Tools — The tools are there to be used. But, in many instances, are being misused in the same manner that a scalpel is when it's made to cut bread instead of the job it was designed to do.

Person to person contact is good, if one person doesn't do all the talking; conferences are good, if one doesn't become just part of the herd; written communications are good, if they don't just set down in print what is already general knowledge.—A. C. Pocius, Colorado Fuel & Iron Corp., Denver, Colo.

Better Job

Sir—We would appreciate receiving eighty copies of your Modern Management Series article, No. 12, "Success in Business Takes More Than Urge to Get Ahead."

We would like to take this opportunity to congratulate you people on the fine job you are doing in enlightening all of us as to how we can do a better job from day to day.—H. G. Epperson, Dir. of Public Relations, Dempster Bros., Inc., Knoxville, Tenn.

Dollar Series

Sir—Could you please furnish us with three reprints of your "How To Get More For Your Metalworking Dollar" article, Number 11, in the Sept. 5 issue?

This article helps to round out the other fine articles you have printed in this series.—D. E. Hess, Industrial Engr., York Div., Borg-Warner Corp., York, Pa.

▪ Copies are on the way. Readers can still obtain one copy of each of these earlier features on stainless steel, welding, material handling, plating, inspection, aluminum, organic finishing, stamping, and machining—ferrous metals.—Ed.

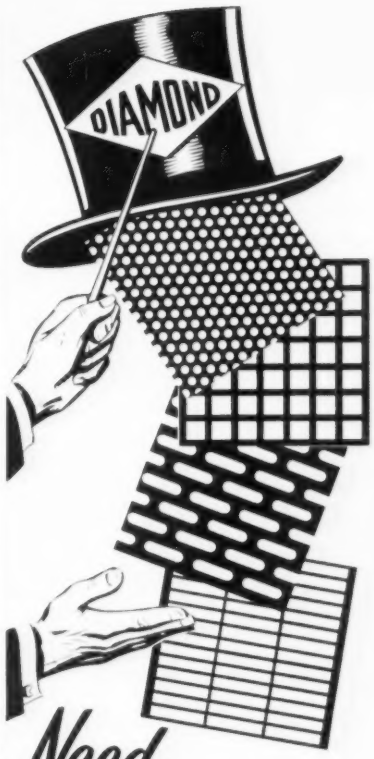
Grinding Research

Sir—May I have a copy of your article, "New Theory Bolsters Grinding Research?" It will be much appreciated.

If you have any references in the literature to Prof. Sato's mathematical analysis, or the use of electronic computers in this connection, they would also be very valuable. We have a small electronic computer now.—A. E. Smith, Research and Development, Jones & Lamson Machine, Springfield, Vermont.

▪ Prof. Sato used no computer. But we are sending a copy of his original technical manuscript which contains his mathematical analysis along with a copy of our article. A limited number of copies of the complete paper are available to other interested readers.—Ed.

"Now, let's compare it to a human hair."



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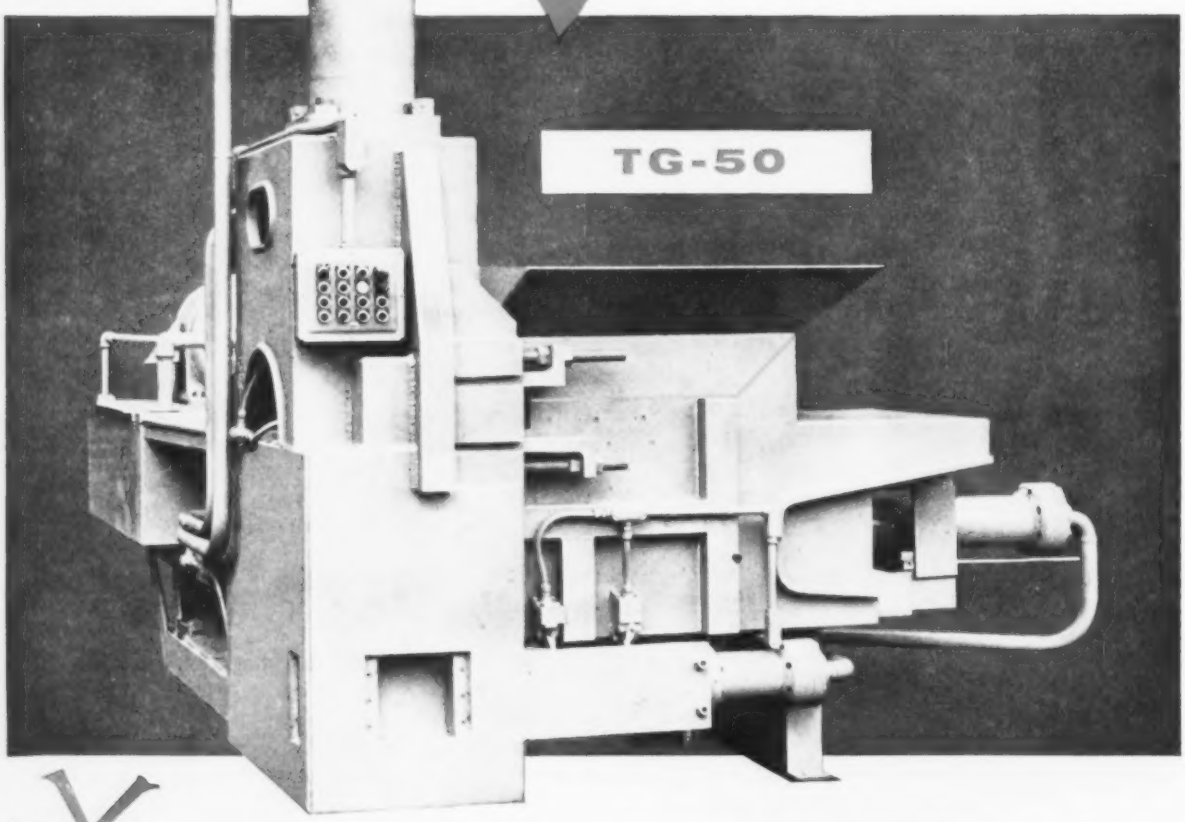

The new Harris TG-50 Baler is designed especially for baling materials uniform enough for conveyor type feeding. All bales measure 8" x 8" x variable length, and can be made at a rate of 120 bales of non-ferrous materials per hour. This press sits on top of the ground and can be moved with a minimum of effort.

Talk with a man from Harris

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FATIGUE CRACKS

Price Crisis

A prominent Milwaukee scrap dealer calls our editors frequently to discuss the scrap market in general and particularly scrap prices.

Last week he checked in and, as usual, prices were very much on his mind, but not scrap prices this week. In baseball-mad Milwaukee, the big crisis was in the "going" price of World Series tickets.

Pressure's On — The "going" price last week, probably higher as game time approaches, was $80 for box seats, $50 for lower grandstand. His company had obtained quite a few legitimately from the box office, but within a few hours they were distributed to business contacts and friends, in some cases, with a little applied pressure.

Where will our friend be sitting during the series?

"Right in front of my TV set," he says ruefully.

Asian Flu, Too?

Midst all the controversy on the serious matter of inflation, here's an item we thought would give you a chuckle. It's from a speech by Roger M. Blough, U. S. Steel Corp.'s chairman of the board, before the American Bankers Assn. in Atlantic City, N. J., last week.

"The other day, I received a letter from a retired school teacher who is living on his pension in a trailer park in Florida, and who is feeling the pinch of inflation. In the envelope was a notice addressed 'To Our Safe Deposit Customers,' which he had just received from his bank in St. Petersburg. It read as follows:

" 'Due to the rise in the price of steel and increased operating costs, it becomes necessary for us to increase the rental of our safe deposit boxes. This increase is reflected in the attached bill.'

"On the back of this notice, the school teacher had written a little note saying:

" 'The notice on the reverse of this slip amused me no end because I am one of your small shareholders. Of course, my tiny safe-deposit box was bought long before U. S. Steel last raised prices. But perhaps you can use this absurd notice to show how U. S. Steel is being made the goat for heavy rains, drought, Asian flu and the Japanese beetle.' "

New Puzzler:

Many thanks to J. J. Knight, Sharon Steel Corp., Fairmont, W. Va., for this one:

An explorer in Africa desires to reach the Bongo village. He is going along a road toward the village and arrives at an intersection where there are 3 branch roads. He does not know which of the 3 roads leads to Bongo, but there are two native tribesmen at the intersection.

A peculiarity of this tribe is that when 2 are together, one will always tell a lie. A stranger does not know which one will be telling the truth. The explorer studies a moment and directs a single question to the two natives. The answer by either native will put him on the right road. What is the question the explorer asked?

"I could never become a Communist. The hammer and sickle always reminds me of work."

■ TMI has a special gift in the field of small diameter tubing ! It has a precision-interpretation ability that turns the toughest of drawing board pioneering ideas into tubing facts of progress: for aviation, for instrumentation, for nuclear development, for chemical applications without number.

The TMI organization is considered one of the most flexible in the industry. With its years of specialized experience and exclusive technical equipment, it helps solve cost problems, performance problems, fabrication difficulties. Its "test mark" is its record of service and its nationwide reputation.

The Mark of Quality TMI

YOU CAN EXPECT MORE OF TMI STAINLESS STEEL AND SPECIAL ALLOY TUBING BECAUSE WE BUILD MORE QUALITY INTO IT !

Metallurgists, Engineers, and Manufacturers specializing in Small Sizes: .050" to .625"

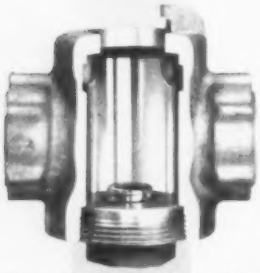
TUBE METHODS INC.

BRIDGEPORT (Montgomery County), PENNSYLVANIA

Plug rotates as journal

bearing-smooth operation.. PLUS A TIGHT SEAL

acf LUBRICATED CYLINDRICAL PLUG VALVES



Smooth bearing-surface in body

The cylindrical plug of your acf valve fits and turns in the valve body with the same ease and smoothness as a shaft in a journal bearing. The plug rides freely on a film of lubrication to provide a tight seal without binding.

A patented head gasket, made of Teflon*, is backed by the lubricant and provides a dead-tight head seal. Self-lubricating Teflon reduces friction between plug and body at the head to further minimize turning torque.

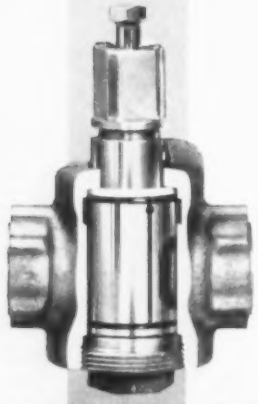
When you specify acf Lubricated Plug Valves in new—or replacement—installations you will save money initially, and later on repairs and maintenance.

acf valves are available in semi-steel, carbon steel, bronze, and aluminum.

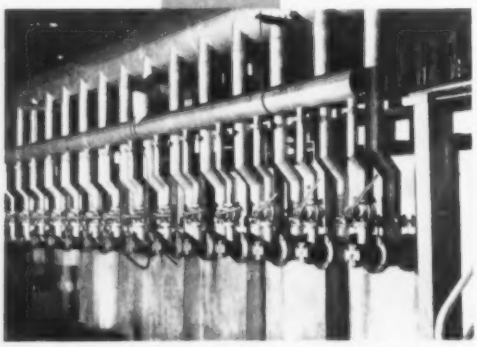
Ask your Industrial or Mill Supply Distributor for acf Valves.

Sizes: ½" through 30".

Pressures: Semi-steel; 175 lbs. WOG to 500 lbs. WOG. Carbon steel; ASA 150 and ASA 300.



acf Cylindrical Plug Valves for easy, positive action



acf Valves on gas fired billet furnace in steel mill.

W-K-M

DIVISION OF acf INDUSTRIES INCORPORATED

PLANT: MISSOURI CITY, TEXAS
MAILING ADDRESS: P. O. BOX 2117, HOUSTON, TEXAS

Write Dept. T-1003
for new ACF Valve Catalog 400.

5706

MANUFACTURERS OF W-K-M GATE VALVES acf LUBRICATED PLUG VALVES
KEY-KAST ALLOY STEEL PIPING FITTINGS KEY RETURN BENDS AND FITTINGS

*DuPont's tetrafluoroethylene resin. acf is a registered trademark of acf Industries, Inc.

EXHIBITS, MEETINGS

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22.)

AtomFair '57 — Oct. 28-31, New York. (Atomic Industrial Forum, 3 E. 54th St., N. Y. 22.)

Metal Show—Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

OCTOBER

The Electrochemical Society — Semi-annual meeting, Oct. 6-10, Statler Hotel, Buffalo. Society headquarters, 216 W. 102nd St., New York.

American Institute of Steel Construction — 35th annual meeting, Oct. 6-11, Hotel del Coronado, Coronado, Calif. Society headquarters, 101 Park Ave., New York.

American Society of Lubrication Engineers—Fourth conference, Oct. 7-9, Royal York Hotel, Toronto, Ont., Canada. Society headquarters, 84 E. Randolph St., Chicago.

Electric Overhead Crane Institute —Fall meeting, Oct. 10, Hillbrook Country Club, Cleveland. Society headquarters, One Thomas Circle, Washington 5, D. C.

Society for Experimental Stress Analysis — Annual meeting, Oct. 9-11, Hotel El Cortez, San Diego, Calif. Society headquarters, P. O. Box 168, Cambridge 39, Mass.

Committee on Vacuum Techniques —Fourth annual symposium on high vacuum technology, Oct. 9-11, Hotel Somerset, Boston. Society headquarters, Box 1282, Boston.

Gray Iron Founders' Society, Inc. —Annual meeting, Oct. 9-11, The Drake Hotel, Chicago. Society

(Continued on P. 16)

Specify *Michigan* Tubing for economy and versatility

A Quality Product

ROUND

¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
⅜" to ⅝"	16 thru 22	⅜" minimum side to 5" maximum side
¾" to 1"	11 thru 22	
1" to 2"	11 thru 20	
2" to 3"	11 thru 18	

Carbon 1010 to 1025

Standard Sizes

Tube Diameter O.D. Size	Maximum Wall Decimal	BWG Gauge	Minimum Wall Decimal	BWG Gauge
⅛	.065	16	.022	24
¼	.083	14	.022	24
½	.095	13	.022	24
⅝	.095	13	.022	22
¾	.095	13	.028	22
⅞	.095	13	.028	22
1	.095	13	.028	22
1⅛	.095	13	.028	22
1¼	.095	13	.028	20
1⅜	.095	11	.035	20
1½	.120	11	.035	20
1⅝	.120	11	.035	20
1¾	.120	7	.035	20
1⅞	.180	7	.035	20
2	.180	7	.035	20
2⅛	.180	7	.035	20
2¼	.180	7	.035	20
2⅜	.180	7	.035	20
2½	.180	7	.035	20
2⅝	.180	7	.035	20
2¾	.180	7	.035	19
2⅞	.180	7	.042	19
3	.180	7	.042	19
3⅛	.180	7	.042	19
3¼	.180	7	.042	18
3⅜	.180	7	.049	18
3½	.180	7	.049	18
3⅝	.180	7	.049	18
3¾	.180	7	.049	
3⅞	.180			
4				

For 40 years

Michigan has been manufacturing tubular parts for leading manufacturers. This acceptance of Michigan tubing has been won by meticulous attention to customer requirements and the supplying of the very best in tubing. The following advantages of low cost manufacture and utmost dependability are yours when you specify Michigan for tubular parts in the fabrication of your products:

1. **It is fabricated in round, square and rectangular shapes, in a wide range of sizes;**
2. **It is always of uniform strength, weight, ductility and weldability;**
3. **It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted and rolled.**
4. **Complete facilities for the COLD DRAWING, ANNEALING and TESTING of tubing we manufacture.**

RESISTANCE WELDED STEEL TUBING

Michigan STEEL TUBE PRODUCTS CO.

THE OLDEST NAME IN ELECTRIC

Consult Michigan

for engineering and technical help in the selection of tubing best suited to your needs.

40 Years in the Business

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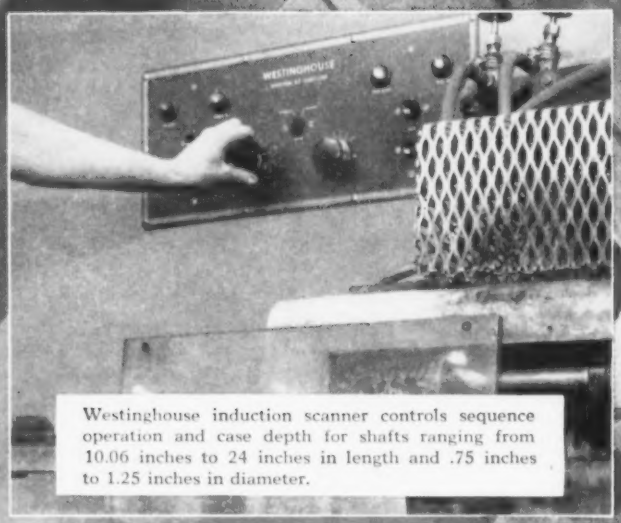
DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—Service Steel Div., Van Pelt Corp., Los Angeles, Calif.—Donald A. Harston, Cleveland, Ohio—Globe Supply Co., Denver, Colo.—W. A. McMichaels Co., Upper Darby, Pa.—William P. Hall & Associates, Dayton, Ohio—John Emery West, Miami, Florida—Gary A. Osborne, Buffalo, N. Y.—Larle M. Jorgensen Co., Houston, Texas

WHAT'S HAPPENING AT



Westinghouse induction scanner controls sequence operation and case depth for shafts ranging from 10.06 inches to 24 inches in length and .75 inches to 1.25 inches in diameter.

PRODUCT AND **PROFIT** IMPROVEMENT

BURGESS-NORTON?

500,000 rocker arm shafts hardened—and no rejects ...with Westinghouse Induction Heating!

At Burgess-Norton Mfg. Co., Geneva, Illinois, Westinghouse Induction Heating is producing five important advantages in hardening automotive engine rocker arm shafts.

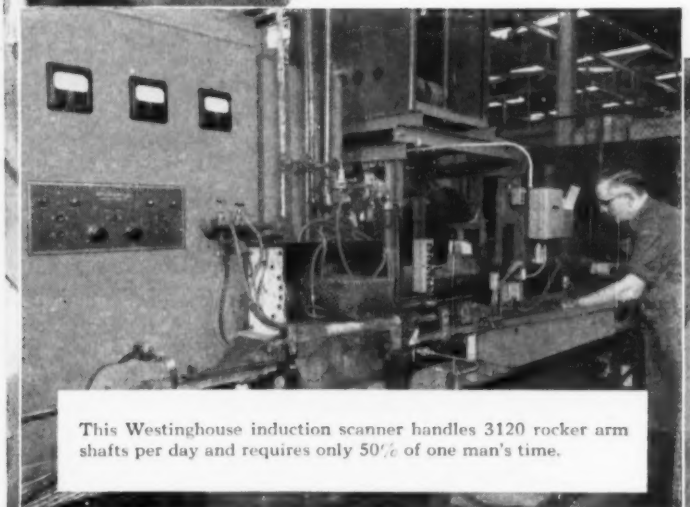
1. No cracking.
2. No distortion.
3. Shafts harden evenly to uniform case depth.
4. Overall savings in manpower.
5. Partial stress relief because of stored heat within the shaft.

The entire operation is automatic. Shafts are conveyed to the induction unit, jigged, spun at 400 rpm while heating to 1550°F., then quenched in a water spray . . . all in just 3.25 seconds for each of six sections on a shaft.

This is exciting, important news for many plants concerned with hardening, heat treating, joining, forging or other metalworking operations. Westinghouse Induction Heating, *within seconds*, puts heat *exactly* where you want it day after day, week after week, without variation. This precision and uniformity is vital with today's high speeds and close tolerances.

Westinghouse Induction Heating units are clean, cool, streamlined and space saving. Westinghouse engineering creates for your individual requirements integrated production line equipment that speeds output, cuts costs, brightens your profit picture.

YOU CAN BE SURE...IF IT'S Westinghouse



This Westinghouse induction scanner handles 3120 rocker arm shafts per day and requires only 50% of one man's time.

WITH WESTINGHOUSE INDUCTION HEATING

BUT MAYBE INDUCTION HEATING IS NOT FOR YOU...LET'S FIND OUT

Telephone collect EDmonson 6-2300, or return this coupon to SALES MANAGER, Industrial Electronics Dept., Westinghouse Electric Corporation, P. O. Box 416, Baltimore 3, Maryland.

I believe that we qualify for Westinghouse Induction Heating. _____Please have your engineer call. _____Please send literature. We make _____(item) from _____ (metal or alloy). Each piece is approx. _____(size) and weighs approx. _____. We work in temperature range of _____and handle approx. _____ per hour. We are interested in: _____Forging _____Hardening _____Joining _____Other.

Please describe briefly _____

Please check below the Westinghouse Induction Heating advantages you believe are superior to your present process.

_____Selective heat _____Safety
_____Instantaneous heat _____Consistent results
_____Minimum scale _____Production-line heating

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Company _____

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Looking for the world's most complete stock of 52100 steel tubes and bars? You've come to the right spot . . . . . .

PETERSON STEELS, INC.
Union, New Jersey
Detroit, Michigan Chicago, Illinois

EXHIBITS, MEETINGS

(Continued from P. 13)

headquarters, 930 National City-E 6th Bldg., Cleveland.

Conveyor Equipment Manufacturers Assn. — Annual meeting, Oct. 12-15, The Grand Hotel, Point Clear, Ala. Society headquarters, One Thomas Circle, Washington, D. C.

Pressed Metal Institute — Annual meeting, Oct. 13-17, Castle Harbour, Bermuda. Society headquarters, 3673 Lee Rd., Cleveland.

Rail Steel Bar Assn.—Fall meeting, Oct. 14-16, Western Hills Hotel, Fort Worth, Tex. Society headquarters, 38 S. Dearborn St., Chicago.

Wire Assn. — Annual convention, Oct. 14-17, La Salle Hotel, Chicago. Society headquarters, 453 Main St., Stamford, Conn.

American Society of Civil Engineers —Annual meeting, Oct. 14-18, Hotel Statler, New York. Society headquarters, 33 W. 39th St., New York.

Society of Plastics Engineers, Inc.—Regional technical conference on polyethylenes—properties and uses, Oct. 17, Hotel Carter, Cleveland. Society headquarters, 34 E. Putnam Ave., Suite 116-118, Greenwich, Conn.

The Magnesium Assn. — Annual Convention, Oct. 17-18, The Biltmore, New York. Society headquarters, 122 E. 42nd St., New York.

Foundry Equipment Manufacturers Assn., Inc.—Annual meeting, Oct. 17-19, The Greenbrier Hotel, White Sulphur Springs, W. Va. Society headquarters, One Thomas Circle, Washington 5, D. C.

National Machine Tool Builders Assn.—Annual meeting, Oct. 22-25, French Lick-Sheraton Hotel, French Lick, Ind. Society headquarters, 2071 E. 102nd St., Cleveland.

American Nuclear Society—Second winter meeting, Oct. 28-31, Henry Hudson Hotel, New York.

The new automatic welding process everybody likes

"WE FOUND THAT DUAL SHIELD WELDING WAS JUST THE THING WE NEEDED TO MAKE A PRODUCTION LINE JOB POSSIBLE" ----- "THE DUAL SHIELD PROCESS IS SIMPLIFIED TO THE POINT WHERE A MAN CAN LEARN TO DO A GOOD JOB WITHIN A DAY'S TRAINING" ----- "DUAL SHIELD WELD GIVEN 40 HOUR VIBRATION TEST AND SHOWED NO FAILURES" ---- "FOR OUR WORK DUAL SHIELD WELDING IS 50 PER CENT FASTER THAN CONVENTIONAL WELDING METHODS INCLUDING SET UP TIME . . . ALSO 50 PER CENT CHEAPER" ---- "IT ENABLES US TO DO WORK THAT FORMERLY WASN'T PROFITABLE BECAUSE OF THE HIGH WELDING COST" ---- "WE NOW MAKE WELDS ON TANKS AT RATE OF APPROXIMATELY 105 FEET PER HOUR. PREVIOUSLY OUR BEST WELDING SPEED WAS APPROXIMATELY 50 FEET PER HOUR" ---- "DUAL SHIELD PROCESS CUTS OUR COST BY 25%" --- "I LIKE THE CLEANER AND SMOOTHER WELD THAT DUAL SHIELD SYSTEM GIVES IN ADDITION TO THE MINIMIZING OF SPATTER DURING THE WELDING PROCESS" --- "IT CU PATTER AND GIVES US A NEAT FINISHED JOB" ----- "ONE OPERATOR IS DO CA EN IN THE SET UP AT OUR PLANT"

NCG®

DUAL SHIELD*

The DUAL SHIELD process is something *new* in welding, something dramatically *new*, something dramatically *better!* It's the new welding process that takes the guesswork and mistakes out of welding by *automatic* control. The proper arc voltage is maintained automatically. The electrode is fed to the work automatically. The weld is automatically protected from contamination, both during deposition and during cooling.

Weldors praise the DUAL SHIELD process; they can do better work faster and with less effort and strain. Welding shops like DUAL SHIELD; it not only cuts costs and avoids waste, it often opens entirely new opportunities for welded construction. Buyers of DUAL SHIELD welded products like them because of the cleaner, neater welds. Read what users of the DUAL SHIELD process say. Try this process on your work. You too will be an enthusiast.

PLEASE TURN THE PAGE.....

NCG® DUAL SHIELD*

(the new automatic process everybody likes)

WELDING

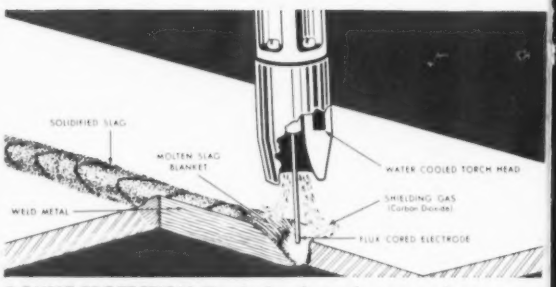
Science takes the guesswork out of welding with the NCG DUAL SHIELD process. Now, better welds are produced continuously because electrode feed and current density are set and held automatically . . . and because the weld is *completely* protected from atmospheric contamination, not only during deposition but during cooling as well.

In NCG DUAL SHIELD welding, inexpensive carbon dioxide gas is automatically fed to the arc to blanket and prevent contamination of the weld. The special flux-cored electrode is fed automatically and continuously from a reel. The flux is never in the way, never hides the weld. The DUAL SHIELD flux-cored electrode affords *absolute control of the amount of flux in the arc.* This is important in order to maintain accurate control of weld chemistry and assure a metallurgically uniform weld deposit. The slag "pops" off as the molten weld metal cools, and the weld can be easily cleaned with a wire brush.

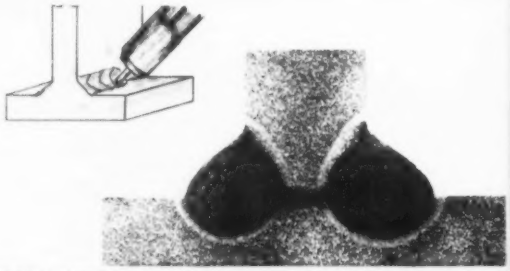
The DUAL SHIELD process is designed primarily for welding all plain carbon steels up to .35% carbon content and type T-1 and A202 steels. It can be used for single-pass welds in the horizontal and flat positions on thicknesses from 3/32" to 1/2". In addition, it is possible to make 1/4" fillet welds at more than 20 ipm and butt welds on 1/4" plate at more than 30 ipm . . . all continuously for foot after foot of exceptionally high quality weld. And, with the DUAL SHIELD process, no cleaning preparation is necessary for welding scaly, oily or rusty steel. The material is cleaned automatically as it is welded.

AUTOMATIC or AUTOMANUAL*

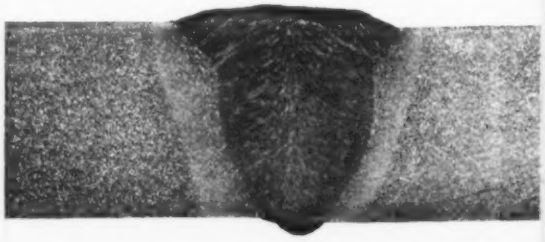
The DUAL SHIELD process is accomplished with the NCG Sureweld welding equipment. The basic Sureweld Type SA-1 outfit is for "Automanual" welding. It consists of electronic welding control, electrode drive, welding gun, and the gas and water cable assemblies. Conversion kits enable you to easily convert this to fully automatic welding. The DUAL SHIELD process makes fully automatic production welding most feasible. It is only necessary to traverse the gun or the work mechanically.



DOUBLE PROTECTION: Flux in the electrode core and a shield of CO_2 work hand-in-hand to produce sound, uniform and clean welds.



UNIFORM WELDS: Once settings are made, the DUAL SHIELD process makes smooth, uniform welds even on scaly, oily or rusty steel.



DEEP PENETRATION: A process feature is its ability to make one-pass welds in mild steel up to ½-in. thick.

NOW . . .

New DUAL SHIELD Welding Bulletin

Just off the press . . . the completely new explanatory literature Bulletin NH-137. Get all the facts . . . complete and detailed description of the equipment and the process . . . case histories . . . all clearly illustrated. Use the coupon or write . . .

NATIONAL CYLINDER GAS COMPANY
840 N. Michigan Ave., Chicago 11, Ill.

Please send me the NCG Bulletin NH-137.

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how to keep costs down

...profit margins up!

ALLEN Engineers will show you how you can save time and money by using standard* ALLEN Hex-Socket Cap and Set Screws instead of specials.

Let's get this straight right away... if your product design MUST have special cap or set screws, then ALLEN's the place to come for them.

But our engineers have found, from a good many years of experience, that designs frequently call for *special* hex-socket cap and set screws that are only slightly "off-standard." These specials take longer to get, cost more.

Allen engineers can probably save *you* both time and money by working with you on ways to use *standard* Allen Hex-Socket Cap and Set Screws, where specials may seem to be necessary. Just send blue prints, or good descriptions, of your product designs to our Engineering Department, or talk with your Allen Field Representative.

*ALLEN **manufactures 1457 *standard* items**

Stocked and sold by leading industrial distributors everywhere

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Stainless Steel

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World's Widest Range of Standard Steels

Gives Your Product Sales Appeal

Republic ENDURO Stainless Steel is an unmistakable sign of quality in appliances, housewares and flatware. A quality that sets your product off from the commonplace. Quality that changes *eyers* to buyers. Quality that gives your product sales appeal in the market place.

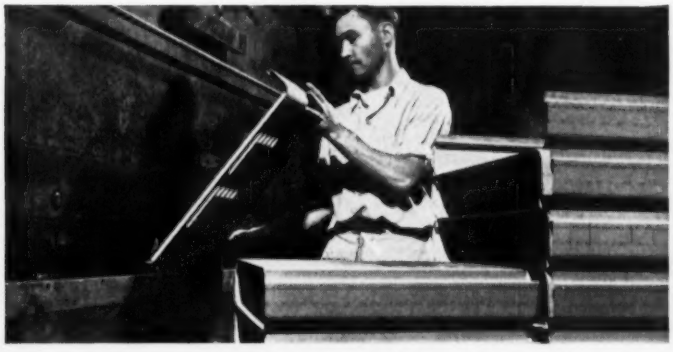
There is no reason why your product shouldn't have this sales advantage now. Fabricate ENDURO on your present equipment, with little or no change in procedure. Bend it, draw it, stamp it, spin it, roll-form it, weld it, solder it, emboss it, etch it—without difficulty.

ENDURO is solid stainless all the way through. There's no surface to wear away. No danger of flaking, peeling, chipping or cracking. No need for expensive plating, lacquering, or electrochemical treatments, to enhance ENDURO's outstanding corrosion-resistance or lustrous beauty.

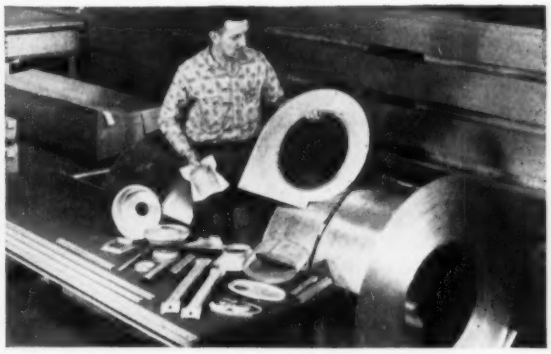
Use ENDURO in appliances to obtain freedom of design. Its extremely high strength-to-weight ratio permits use of thinner, lighter sections to span large areas in an unbroken sweep. Use ENDURO for brightwork. It has the strength to withstand the abuse of everyday use. Use ENDURO for functional parts. Its strength, heat-resistance and corrosion-resistance make it the perfect metal for any application involving heat and cold. Use ENDURO to give your product sales appeal.

Republic metallurgists and engineers will assist you in selection, application, and processing of ENDURO Stainless Steel. No obligation, of course. Just mail the coupon.

MORE REPUBLIC PRODUCTS FOR SALES APPEAL



REPUBLIC ELECTRO PAINTLOK is used for the exterior panels or cabinets of ranges, refrigerators, freezers, dryers, washers, air-conditioners, etc. It provides an excellent paint-adhering surface—even after severe forming operations. Electro Paintlok is produced by electro galvanizing and a chemical treatment process. Sheets are shipped from the mill in prime condition for painting. Sometimes cleaning and priming may be eliminated. Only the final finish need be applied for full protection and attractive appearance. Send coupon for full details.



REPUBLIC CONTINUOUS GALVANIZED steel sheets solve a variety of problems for manufacturers seeking inexpensive, long-lasting corrosion protection. Continuous galvanized sheets are often used for liners in freezers, coolers and dispensers. The uniform, tight zinc coating won't crack, peel or flake off under the most rugged fabrication. Excellent ductility assures easy workability, yet the sheet is sufficiently rigid to withstand severe use. Completed products are positively protected without the expense of individual hot dip galvanizing after forming. Write for facts.

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and Steel Products

REPUBLIC STEEL CORPORATION
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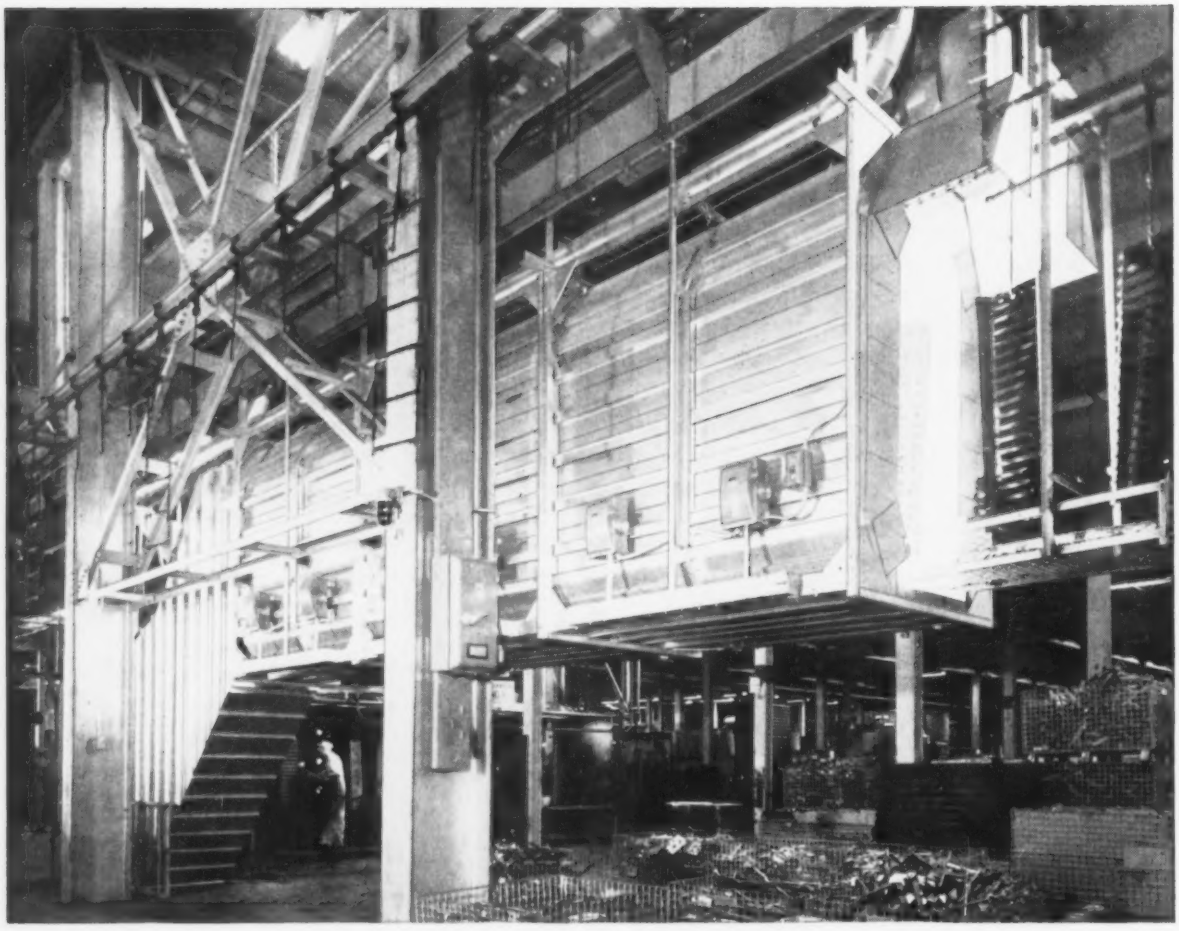
☐ Have a Stainless Steel Metallurgist call.

Send more information on:

☐ ENDURO® Stainless Steel
☐ Electro Paintlok® Sheets
☐ Continuous Galvanized Sheets

Name _____ Title _____
Company _____
Address _____
City _____ Zone _____ State _____



Fostoria Radiant Oven at Westinghouse, Columbus, Ohio

PROCESSES 24,000 PARTS EVERY WEEK

It takes only 15 minutes to dry refrigerator back-plate condensers for stacking—at the Columbus, Ohio Westinghouse plant, a recent addition to the company's Electric Appliance Division.

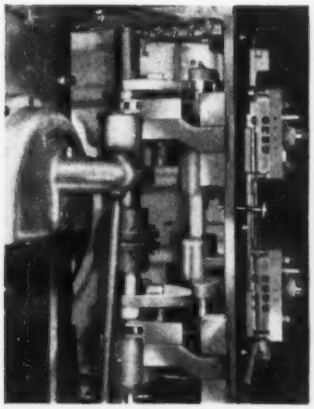
Using a fast-drying Fostoria Radiant Oven, this modern plant is able to process 10,000 to 12,000 condensers for major appliances, plus the same number of miscellaneous small parts, every 5-day week. In thousands of similar industrial applications, Fostoria Radiant Ovens speed up production, save valuable man-power . . . and cut operating costs as much as 50%. Fostoria design permits overhead installation to save work space (as shown above) and allows easy relocation, if necessary. Want to know how an efficient Fostoria Radiant Oven can save money and improve product quality *for you?* Send for complete details today!

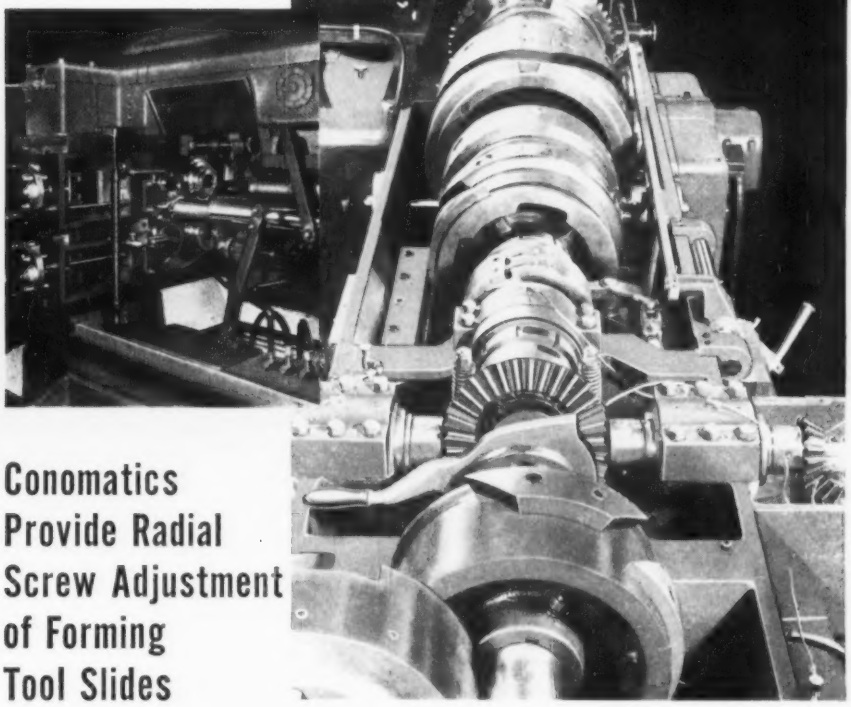
Write for free,
fact-filled booklet—
"Applications Unlimited"

INFRA-RED SYSTEM
fostoria

5511

FOSTORIA PRESSED STEEL CORPORATION • Dept. 1024, Fostoria, Ohio
Pioneer manufacturer of radiant equipment—from components to complete ovens



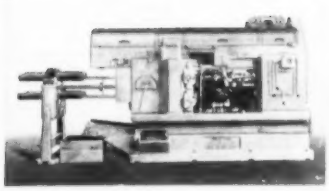


Conomatics Provide Radial Screw Adjustment of Forming Tool Slides

- Models 2⅝" LA, 3½" AD, 5" KL, and 5¼" KR Conomatic Four Spindle Bar Machines are equipped with a number of quick job-change features. One of these is the all-position end attachment drive for the mounting of endworking opposed spindles in all positions, with independent feed to as many as three opposed spindles on a single setup.

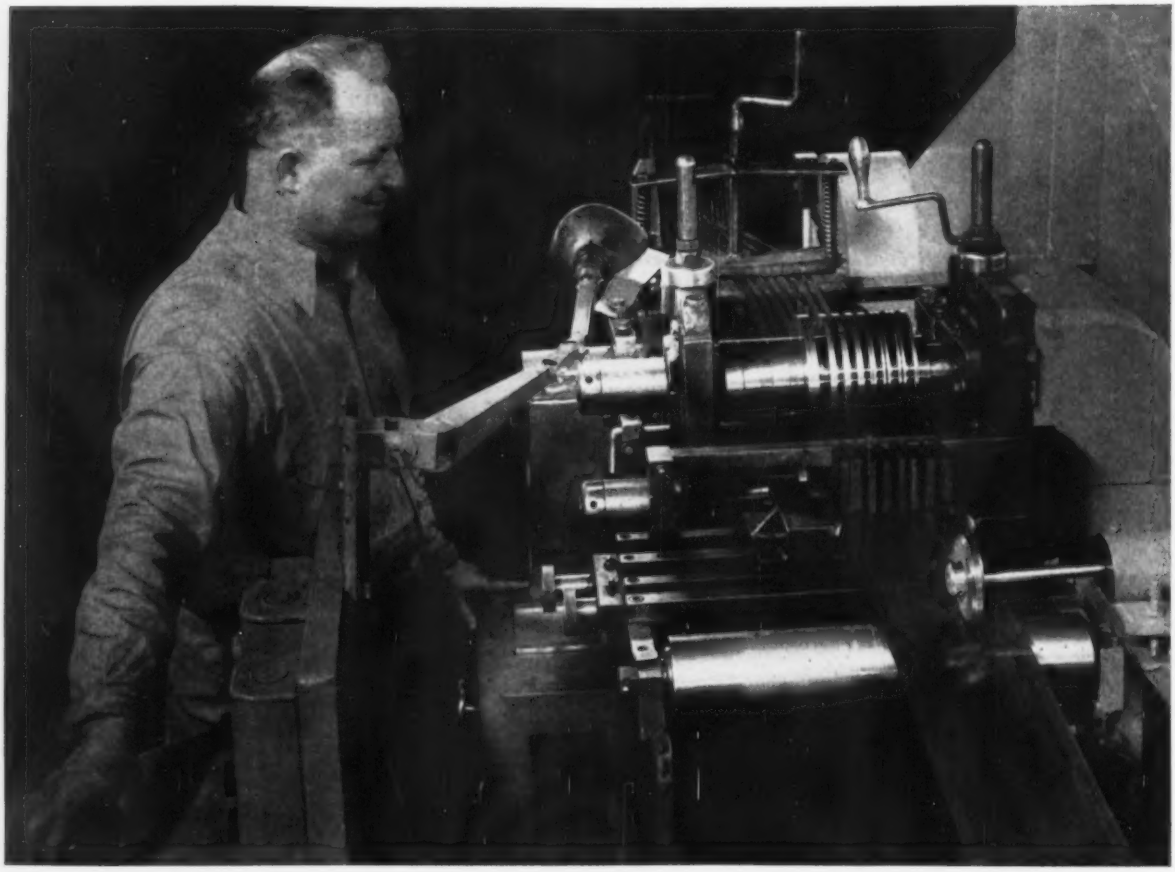
Another feature that is of considerable importance in tooling up is the radial screw adjustment of all sideworking slides. Trial cuts may be taken to correct diameters with form tools without changing the clamped positions of the form tool holders.

All Conomatic quick changeover models are equipped with dial adjustment of the working stroke of all tool carrying slides. Besides the Four Spindle machines there are three quick change Six Spindle models in 9/16", 1" and 1⅝" sizes. Write, wire, or phone for literature.



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U S A.



Yoder Slitters Supply Varied Strip Widths for Tinnerman *Speed Nuts*®

Tinnerman Products, Inc., Cleveland, Ohio, produces more than 10,000 different shapes and sizes of "SPEED NUT" brand fasteners for industry . . . many of them to special specifications.

To do this, Tinnerman uses slit steel strands ranging in width from $\frac{1}{8}$" to $7\frac{1}{2}$". To carry an inventory of the many strip widths required to meet normal and unusual demands would be almost impossible.

Tinnerman overcomes these inventory and supply problems by doing their own slitting on two Yoder slitters. This enables them to supply the plant with any strip size required from a relatively small inventory of 6" and 9" width purchased coils. In slitting narrow strands, such as these from small coils, a Yoder slitter may be profitable on a production as low as 25 tons per month.

Here is a fine example of how a small investment in Yoder slitting equipment greatly simplifies and speeds production while effecting important operating economies.

The saving made in time alone, reflects in better customer service through faster completion and delivery of finished products.

If your steel strip or sheet slitting requirements are as low as 100 tons per month or even less, a medium size Yoder slitter can be a very profitable investment for you. The Yoder line includes units of every size and capacity . . . of the most advanced engineering design. Send for the Yoder Slitter Book—a comprehensive text on the mechanics and economics of slitters and slitting line operation, with time studies, cost analyses and other valuable data. Write to:

THE YODER COMPANY • 5510 Walworth Ave., Cleveland 2, Ohio

ENGINEERING **YODER** MANUFACTURING

ROTARY SLITTING LINES

PIPE AND TUBE MILLS (ferrous or non-ferrous)

COLD ROLL FORMING MACHINES

NEW GOLDEN BONDERITE for Aluminum

Uniform color means uniform coatings and uniform efficiency

It's the simplest thing in the world to check on the efficiency of a Golden Bonderite installation. Just look at the color of the aluminum as it comes out of the Bonderite machine. The uniform golden coating looks the same—and it is the same—24 hours a day, seven days a week.

Golden Bonderite sets entirely new standards of efficiency and performance as a paint base for aluminum and its alloys. Operated with the Parker "Reactifier," the Golden Bonderite solution can be used indefinitely, ending the costly necessity of dumping the bath at frequent intervals. Normal chemical replenishment keeps the Golden Bonderite solution in continuous balance.

This ease and certainty of achieving uniformly excellent results means real savings for aluminum fabricators.

It guarantees an effective base for paint.

It breaks the finishing line production bottleneck.

It saves money on chemicals.

It saves money on rejected parts and minimizes field calls because of finish failures.

There are no limitations on the use of new Golden Bonderite. It may be applied by spray or immersion. Treatment cycles can be set to suit production speed and equipment.

Samples of Golden Bonderite-treated aluminum, plus test data, are available for your inspection. Write or call.

How Parker "Reactifier" Works

In conventional surface treatments of aluminum, work passing through the solution causes a buildup of impurities. As impurities increase, solution efficiency decreases until there's nothing to do but dump the bath and start over.

The Parker "Reactifier" removes these impurities as fast as they are formed in the Golden Bonderite solution. Constant circulation of the Golden Bonderite through the exclusive "Reactifier" means a balanced, efficient solution that can be used indefinitely.

Write for Bulletin in COLOR!

Get your copy of the descriptive bulletin on Golden Bonderite and its companion, Green Bonderite, for aluminum. It's new!

Since 1914—leader in the field

PARKER RUST PROOF COMPANY
2197 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE	TROPICAL
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces	heavy duty maintenance paints since 1883

**Bonderite, Bonderlube, Parco, Parco Lubrite, —Reg. U.S. Pat. Off.*

How Exhaustive Tests Guard the High Quality of Stainless Steel at J&L

There is no substitute for quality. And there is no substitute for *testing* to assure the quality of a product. The men, machines and testing devices, in the laboratories at J&L Stainless Steel Division, are as important to the finished product as the men on the ladles, furnace or mill. They are the men who check the steelmaking process each step of the way . . . analyzing it chemically and metallurgically . . . etching it to see if there are internal weaknesses . . . pulling it apart to check its tensile strength . . . subjecting it to shock impact tests at room and sub-zero temperatures . . . determining its ability to harden under thermal treatment . . . checking its hardness . . . magnifying it a thousand times to study its microstructure.

It is here, in the testing laboratory, that science and technology join experience and skill to produce the finest stainless steel available . . . anywhere.

Rush Orders Filled from Ready-to-ship Inventory

Quality, plus the ability to ship a wide range of stock *immediately*, is daily taking our customers "off the spot". A stock of hundreds of tons of finished stainless bars in a variety of grades and sizes is now available. Write for our latest stock lists, or for quotations on bars or billets.

Jones & Laughlin
STEEL CORPORATION
STAINLESS STEEL DIVISION
Box 4606 • Detroit 34, Michigan
FORMERLY ROTARY ELECTRIC STEEL CO.

This metallographic microscope is used to inspect for cleanliness and proper structure.

A Rockwell Hardness Tester is used to measure the hardness of a specimen after heat treatment.

Complete heat treating facilities are available for use in preparing metal samples for testing.

Tensile testing determines ultimate tensile strength, proportional limit, yield strength, elongation and reduction of area.

Magniflux testing determines internal quality.

Frogs and Florists

Florists keep flowers in place by sticking the stems into the sharp pins of a florist frog—sharp pins that are often made from hard drawn, low carbon CF&I-Wickwire Pin Wire which is free from scratches and other surface imperfections.

Chances are you don't need wire to make florist frogs. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

Check This List!

FOR THE WIRE YOU REQUIRE, SEE CF&I-WICKWIRE.

FLAT AND SHAPED WIRES
Armor Wire
Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE
Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire
Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE
Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)
Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE
Bag Tie Wire
Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
Strand Wire
Tying Wire
Welding Wire
Wissco Iron Wire
Industrial Quality Wire
Cold Rolling Quality Wire
Heading, Forging or Roll Threading Quality Wire
Medium High Carbon Wire

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Oklahoma City • Phoenix Pueblo • Salt Lake City • Wichita • PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland San Francisco • Seattle • Spokane • WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo Chicago • Detroit • New Orleans • New York • Philadelphia • CF&I OFFICE IN CANADA: Toronto
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

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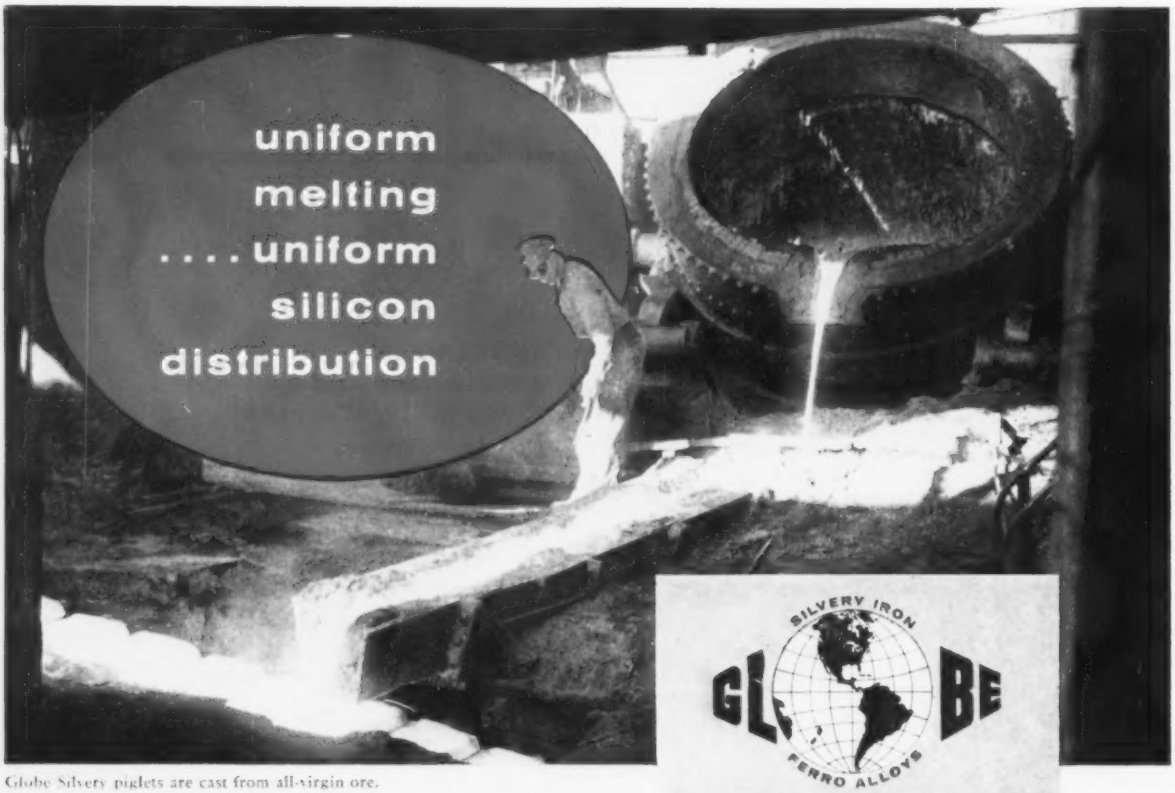


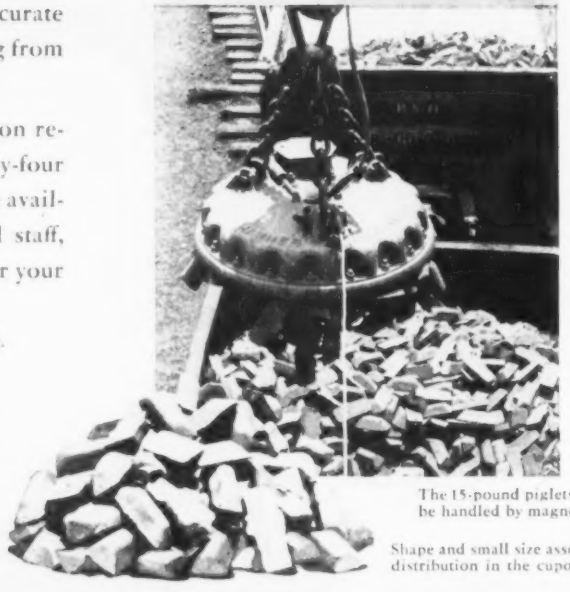
Globe Silvery piglets are cast from all-virgin ore.

SILVERY IRON
GLOBE
FERRO ALLOYS

Globe Silvery Pig Iron provides accurate silicon control with all grades ranging from 6% to 16% silicon.

Originated in 1872, Globe Silvery Iron remains, today, in a class by itself. Eighty-four years of research and development are available, through a skilled metallurgical staff, to help you select the correct grade for your requirements.

Service Department available without obligation.



The 15-pound piglets can easily be handled by magnet or hand.

Shape and small size assure even distribution in the cupola.

P M

PICKANDS MATHER & CO.

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Serving Industry Since 1883

IRON ORE • PIG IRON • COAL • COKE • FERROALLOYS

No matter how you say it . . .

*TRANSLATION: CUTTING OIL

The performance and the brand are the same around the world

Other Outstanding Shell Industrial Lubricants

Shell Tellus Oil—for closed hydraulic systems

Shell Alvania Grease—multi-purpose industrial lubricant

Shell Turbo Oil—for utility, industrial & marine turbines

Shell Rimula Oil—for heavy-duty diesel engines

Shell Talona R Oil 40—anti-wear crankcase oil for diesel locomotives

Shell Dromus Oils, a quality line of soluble cutting oils, permit higher speeds and greater feeds while extending tool life. They have excellent wetting and cooling properties and are not sticky or greasy.

Dromus® Oils have the added advantage of being easy to mix in hot or cold, hard or soft water. They form emulsions which remain stable in practically any concentration required in the shop.

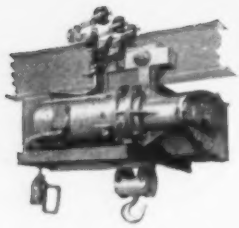
Today Dromus Oils are available to your customers abroad. You can be sure that they will enjoy the same efficient performance your domestic customers rely upon.

• • •

For more information, write Shell Oil Company, 50 West 50th Street, New York 20, N. Y., or 100 Bush Street, San Francisco 6, California.

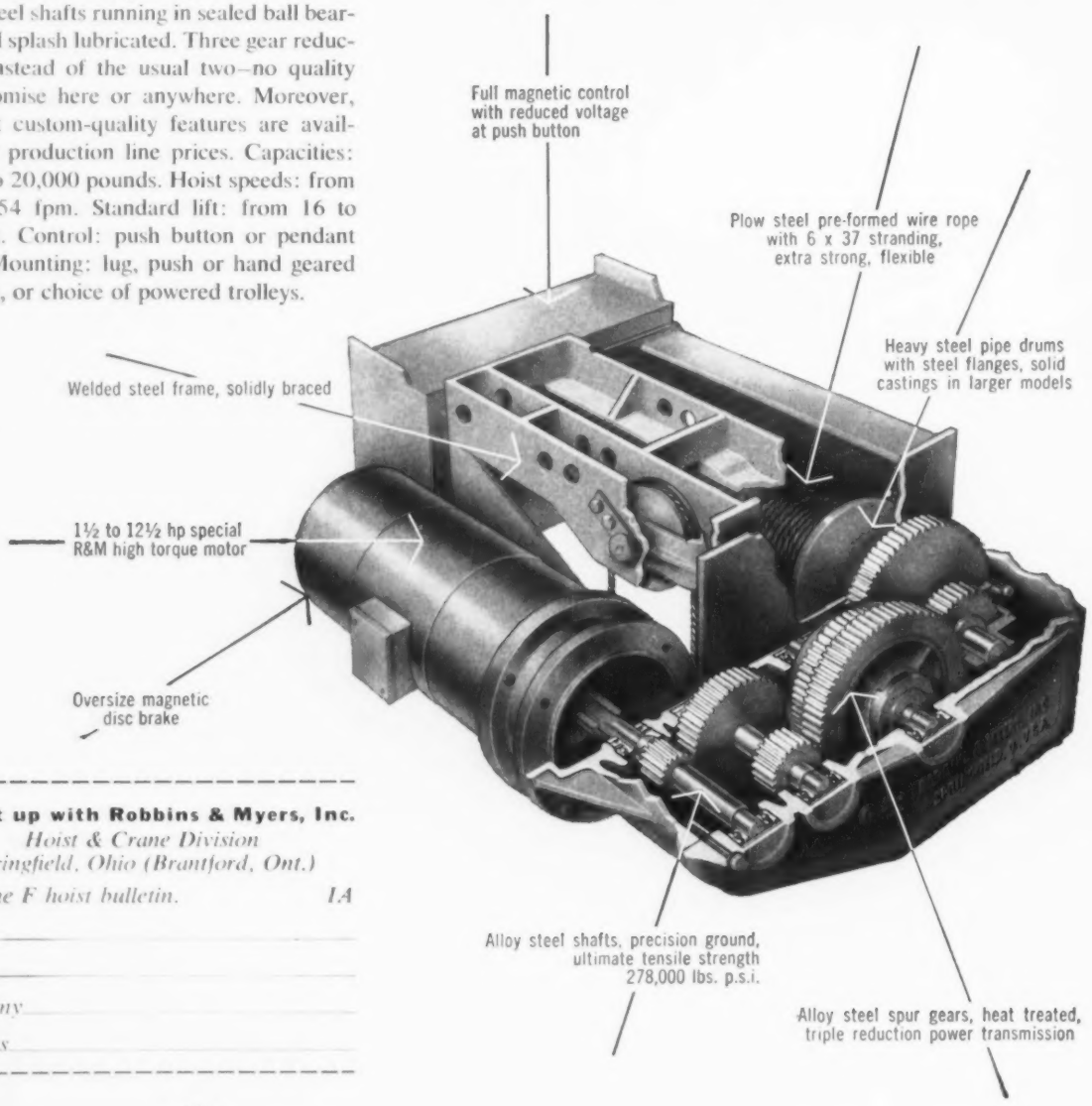
SHELL DROMUS OILS

SHELL



R&M F hoists cut down the cost of lifting but the F hoists save still more money. Dollars usually spent on maintenance become dollars earned because of the extra stamina built into each component. Look at the gearing—here are precision cut alloy steel spur gears, wide faced and heat treated for durability. They're mounted on alloy steel shafts running in sealed ball bearings, all splash lubricated. Three gear reductions instead of the usual two—no quality compromise here or anywhere. Moreover, F hoist custom-quality features are available at production line prices. Capacities: 1000 to 20,000 pounds. Hoist speeds: from 10 to 54 fpm. Standard lift: from 16 to 40 feet. Control: push button or pendant rope. Mounting: lug, push or hand geared trolleys, or choice of powered trolleys.

choose a hoist with extra stamina


Full magnetic control with reduced voltage at push button
Plow steel pre-formed wire rope with 6 x 37 stranding, extra strong, flexible
Heavy steel pipe drums with steel flanges, solid castings in larger models
Welded steel frame, solidly braced
1½ to 12½ hp special R&M high torque motor
Oversize magnetic disc brake
Alloy steel shafts, precision ground, ultimate tensile strength 278,000 lbs. p.s.i.
Alloy steel spur gears, heat treated, triple reduction power transmission

take it up with Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)

Send me F hoist bulletin. IA

*Name*_____

*Title*_____

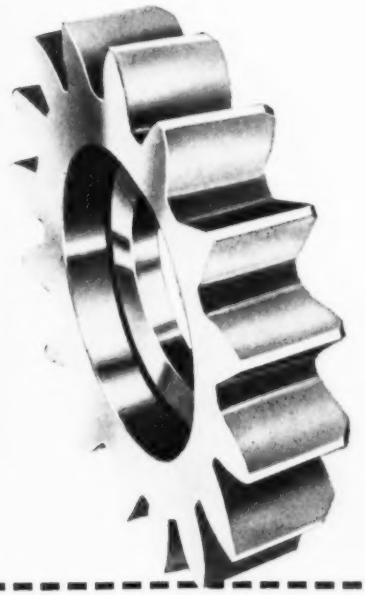
*Company*_____

*Address*_____

ROBBINS & MYERS hoists • cranes • winches

Here's the man

who takes the problems out of gear shaper cutter buying



He's backed by the facilities and experience of 44 years of metal-cutting tool development.

Your Illinois Tool Works sales engineer can help you specify the best possible shaper cutters for your individual requirements. He offers the extensive facilities of Illinois Tool Works for the design and production of efficient gear tooling, and through years of personal experience, he can suggest the most effective use of all gear generating equipment. Have this man come in to talk about precision shaper cutters made to your needs. You'll find his advice helpful.

ILLINITE
DIVISION OF ILLINOIS TOOL WORKS
2501 N. Keeler Ave., Chicago 39, Illinois
itw Metal Cutting Tools

"Know Your Gear Shaper Cutters"
Send for this valuable booklet today! It contains information on how tooling costs per gear can be reduced—efficiency improved. Write for your copy, now!

Look to your Illinite Distributor for the most complete line of standard end mills, standard milling cutters and special cutters.

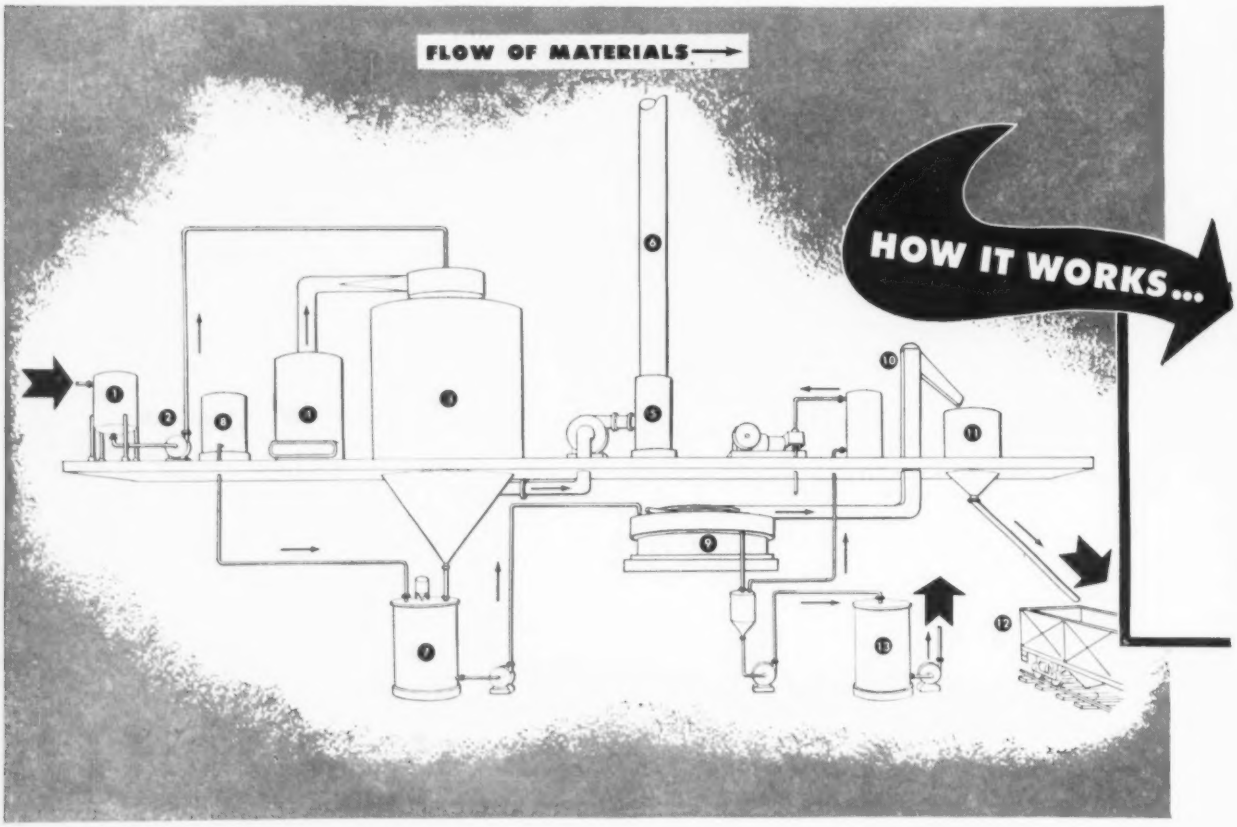
If you operate a

CUT ACID REQUIREMENTS

New continuous process, available from Koppers, of pickling acid used . . . and eliminates waste

FOR OVER A QUARTER OF A CENTURY, wherever a pickling line has been in operation, disposal of spent liquor has been a major headache. But now a new continuous regeneration process—the Koppers Inland-Zahn process— goes a long way toward solving this problem. This system is simple, it is economical, and *it has been proved in actual plant-scale commercial operation in Europe.*

With this process, the only make-up acid needed is the amount consumed in the pickling reaction plus normal losses. *All* available free acid in the used liquor is recovered (up to 50% of the original charge). Labor costs are low—just one man can operate the entire regeneration plant. As a result of these savings, operating costs are substantially below those of any presently available disposal method.



pickling line

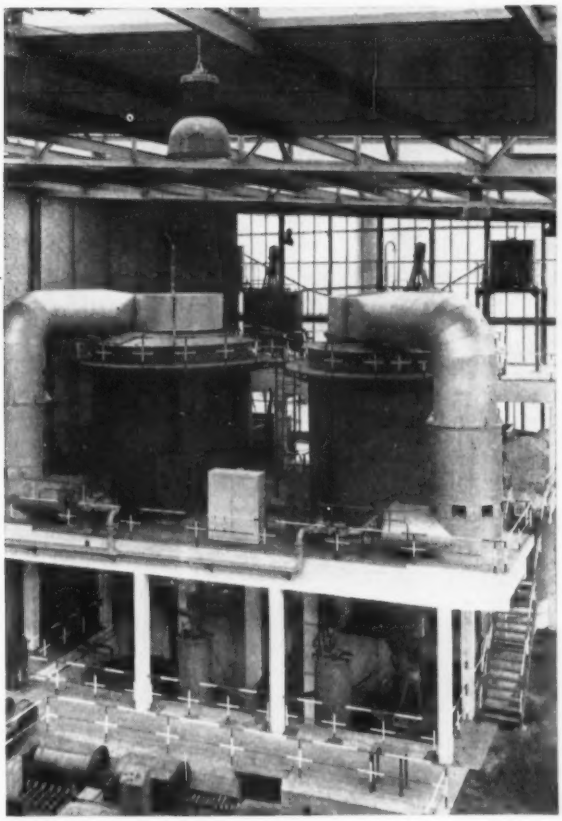
IN HALF!

regenerates up to half liquor disposal problem

PROVED COMMERCIALLY—This process, developed by Inland Steel Company and adapted commercially by Zahn & Co. of West Germany, is now being used successfully in three European steel plants. The benefits achieved include *extremely low maintenance* . . . and more uniform and *higher* acid concentrations in the baths. The latter advantage permits faster steel processing.

NEUTRALIZING PLANTS – The new regeneration process is especially applicable to plants handling 10,000 gallons of effluent, or more, a day. The Chemical Department of Koppers Engineering and Construction Division also designs and builds lime neutralization systems for both large and small pickling operations. Send the coupon for complete information about these and other Koppers Chemical Engineering Services.

Spent pickle liquor (1) is pumped (2) to spray head in an evaporating chamber (3). Here, hot air and flue gases from a combustion chamber (4) concentrate the liquor and cause the ferrous sulfate monohydrate to crystallize out of solution. Vapor laden air is discharged to atmosphere through a mist eliminator and stack (5 and 6). The slurry is dropped into a crystallizing tank (7) where fresh sulfuric acid is added from a metering tank (8). This causes more monohydrate to drop out. The slurry is then separated in a vacuum filter (9) and washed. Salt is conveyed to bins or hopper cars for sale or disposal (10, 11, 12). Mother liquor, containing about 35% acid and 1-2% iron, is pumped to a holding tank (13), ready for dilution and return to the pickling tanks. No reheating is required.



HEART OF THE SYSTEM—This spray dryer concentrates spent liquor to slurry of ferrous sulfate monohydrate crystals suspended in acid. The plant shown here, in Germany, has operated since June, 1954, processing 48,000 gallons per day of waste liquor.

GET ALL THE FACTS!

Koppers Company, Inc.
Engineering and Construction Division
1452 Koppers Building
Pittsburgh 19, Pennsylvania

I would like to receive literature on this new pickle liquor regeneration process . . . and also on Koppers other chemical engineering services. Please send the following:

- ☐ **Regeneration of steel pickling solutions by Koppers Inland-Zahn process.**
- ☐ **Lime neutralization of spent pickle liquor by Koppers.**
- ☐ **"3 Keys to Selecting Your Industrial Contractor," a brochure describing the variety of Koppers construction services and giving reasons why Koppers should build your next chemical plant.**

Name _____

Title _____

Firm _____

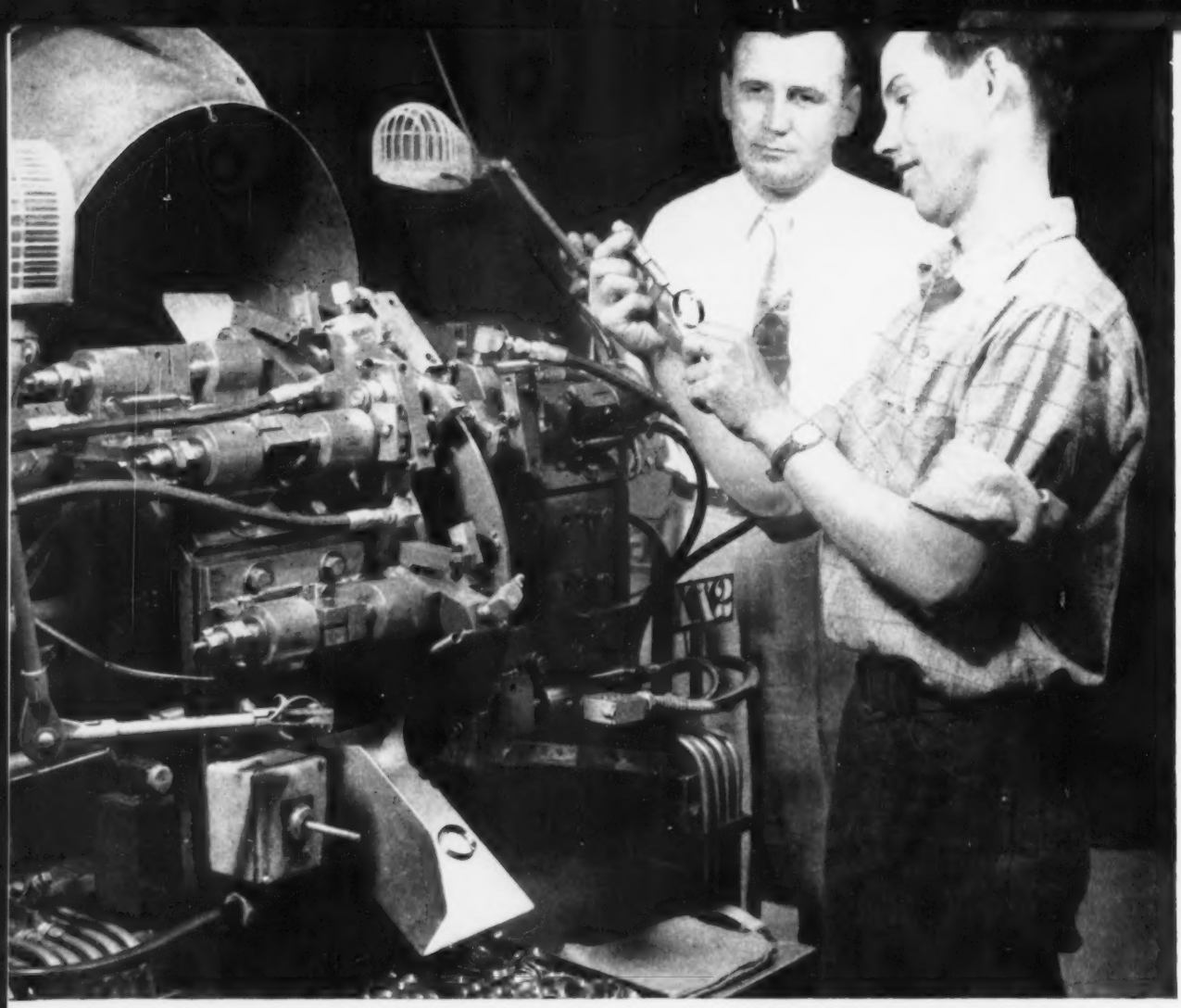
Address _____

City _____ State _____

KOPPERS

KOPPERS

CHEMICAL ENGINEERING SERVICES



William Kody, American Coil Spring sales manager, watches as important product receives periodic check. An automobile window regulator clutch spring, it must be very precise. Johnson music spring wire fits product and machine.

Johnson Music Wire meets the test at American Coil Spring Company where . . .

Automation Demands Uniform High Quality

When American Coil Spring Company needed a precise music spring wire for an exacting auto window regulator spring, past experience prompted it to turn to Johnson Steel & Wire Company, a leading producer of high-carbon fine-specialty wires.

And when the same company—for 32 years one of the nation's top precision springmakers—was looking for ways to further automate its Muskegon, Mich., plant, Johnson came up with another answer—extra-sized coils of weld-free music wire to reduce machine downtime and wire handling.

One of the largest spring wire users in the United States, American Coil has a company watchword—Springs With a Pedigree. Everyone at American Coil lives up to this slogan by constantly emphasizing quality in every phase of production. This has paid off for American Coil by building a reputation for making the best of standard springs—and special springs others can't make.

Every bit of American Coil's skill comes into play on the auto window regulator spring. The spring has to have perfect diameter because it is mechanically inserted in the window clutch during an automatic assembly. Too large, and the spring won't fit. Too small, and it will cause slippage when the window is raised or lowered. Either variation in dimension will cause rejection.

To make the spring, which has three turns and is close wound with extended legs bent opposite, American Coil invented a special machine to combine the coiling and bending operations.

One-half of the challenge solved by the machine, American Coil then had to find a superior wire. Cast and peak had to be exactly as specified. Uniform dimension of .055″ X-L-O music wire had to be held, both within the coil and from coil to coil. Excellent surface was another must. Johnson's X-L-O music wire met these specifications readily. It is available in a full range of sizes between .003″ and .300″ and can be given a number of phosphate or other surface coatings.

Meeting this customer's requirements through ingenuity and good wire is a formula American Coil applied in the case of the extra-sized coils.

Springs are periodically projected onto the screen of this shadowgraph so that minute details of their conformation are compared with drawings.

Operator prepares for a run of springs for automatic bowling alley pin setters. The Johnson music spring wire that feeds this machine comes in a special 500 lb. bundle so that run will be twice as long. Downtime is reduced.

American Coil is committed to a policy of automating wherever possible. In springs requiring Johnson's .080" and larger music wire, Johnson doubled coil sizes from the traditional 250 pounds to 500 pounds without welds. This reduced storage space, simplified handling and reduced downtime on the coiling machines. Moves like this permit American Coil to achieve a daily capacity of 18 million pieces with a labor force that numbers usually 350 people.

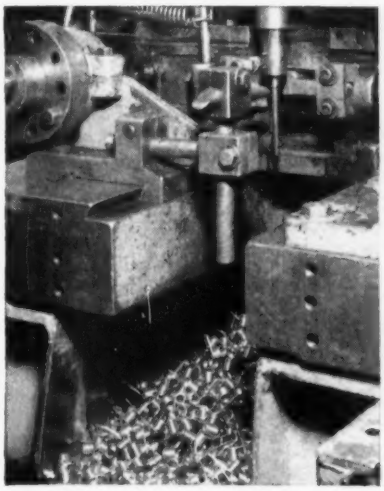
Of the relationship between American Coil and Johnson, Works Engineer James Church of American Coil says:

"The combination of our experience in springmaking and Johnson's superior knowledge of wiremaking, results in a highly successful product."

All these advantages of Johnson's wire are available to you, no matter whether you need music wire or any of the other specialties—

Aircraft Cord Wire . . Armature Binding Wire . . . Belt Hook Wire . . . Bobby Pin Wire . . . Brush Wire . . . Gutterbroom Wire . . . Card Wire . . . Shade Roller Wire . . . Flexible Shaft Wire . . . Heddle Wire . . . Hose Reinforcement Wire . . . Hose Wire . . . Mandolin Wire . . . Piano Wire . . . Rope Wire . . . Safety Pin Wire . . . Special Shaped Wire . . . Staple Wire . . . Metal Stitching Wire . . . Signal Corps Wire . . . MB Spring Wire . . . Tire Bead Wire.

If you have an application which requires high quality and close tolerances, Johnson is ready to serve you. Call your closest district office today.



Nobody watches this machine as it produces thousands of perfectly duplicated springs. If the wire were not highly accurate in dimension and metallurgical characteristics, frequent adjustments would be necessary.

Testing for tension is a constant operation at American Coil Spring. Variations in wire quality would show up here. American is well satisfied with Johnson music wire quality.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

***a subsidiary of* Pittsburgh Steel Company**

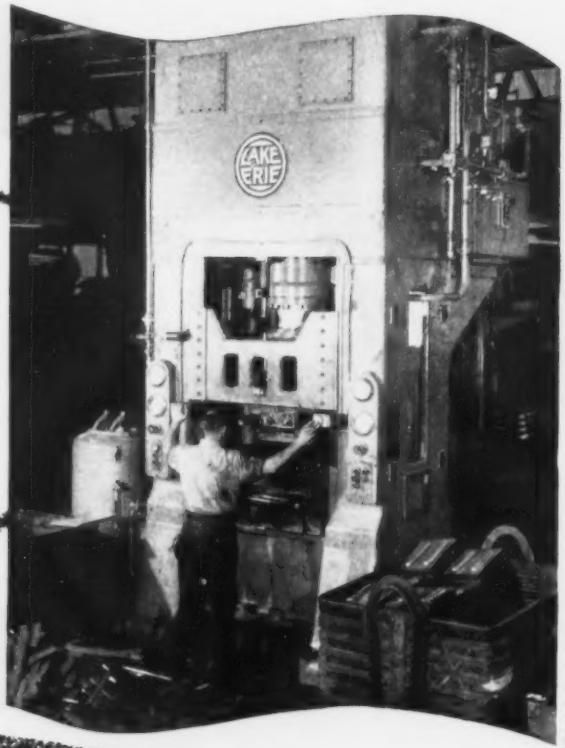
Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

SURE SIGN OF SATISFACTION

...Repeat orders



ONE OF THE MANY

"Lake Eries" serving "IH" is this 200 ton, side housing, single action press with cushion. Press has an 18" stroke, 36" x 38" bed, closing and return speed of 750"/min., and pressing speed of 67"/min.

INTERNATIONAL HARVESTER

has re-ordered from Lake Erie 19 TIMES

International Harvester Company ordered their first press from us in the early 40's . . . have added 21 more Lake Erie presses since then . . . and have a current order on our books. Drawing, forging, hot forming, bending, quenching and straightening are some of the many production operations performed by International Harvester with their Lake Erie presses.

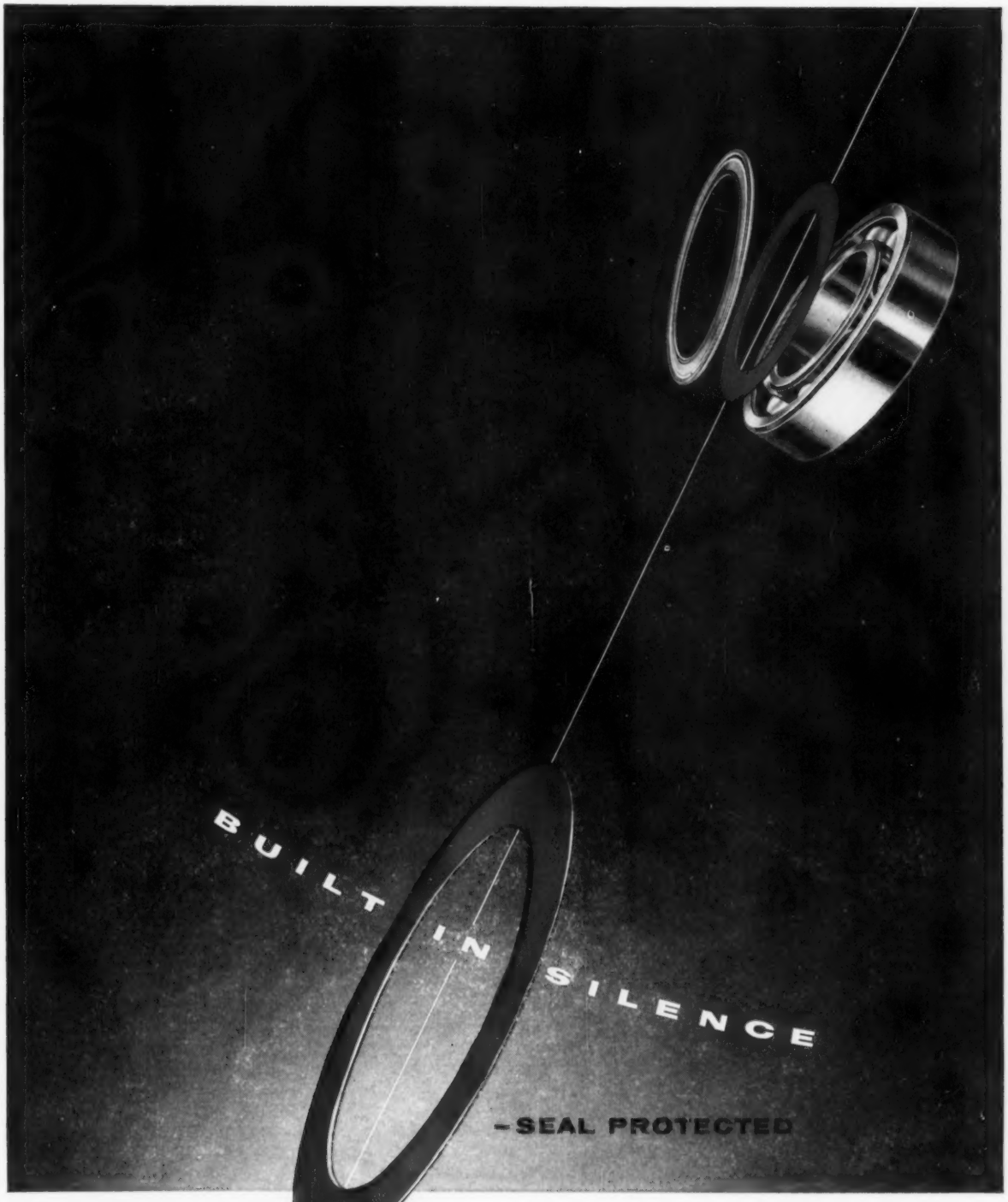
LAKE ERIE
MACHINERY CORP.
BUFFALO, N.Y. U.S.A.

LAKE ERIE MACHINERY CORPORATION, successor to

LAKE ERIE ENGINEERING CORP.

General Offices and Plant, 360 Woodward Ave., Buffalo 17, N.Y.
District Offices in New York, Chicago, Detroit

LAKE ERIE® ● Manufacturers of die casting machines and the most complete line of hydraulic presses for all industry.



EVERY TYPE—EVERY USE

SKF®

- Ball Bearings
- Cylindrical Roller Bearings
- Spherical Roller Bearings
- Tapered Roller Bearings ("Tyson")

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*Reg. U.S. Pat. Off. Tyson Bearing Corporation

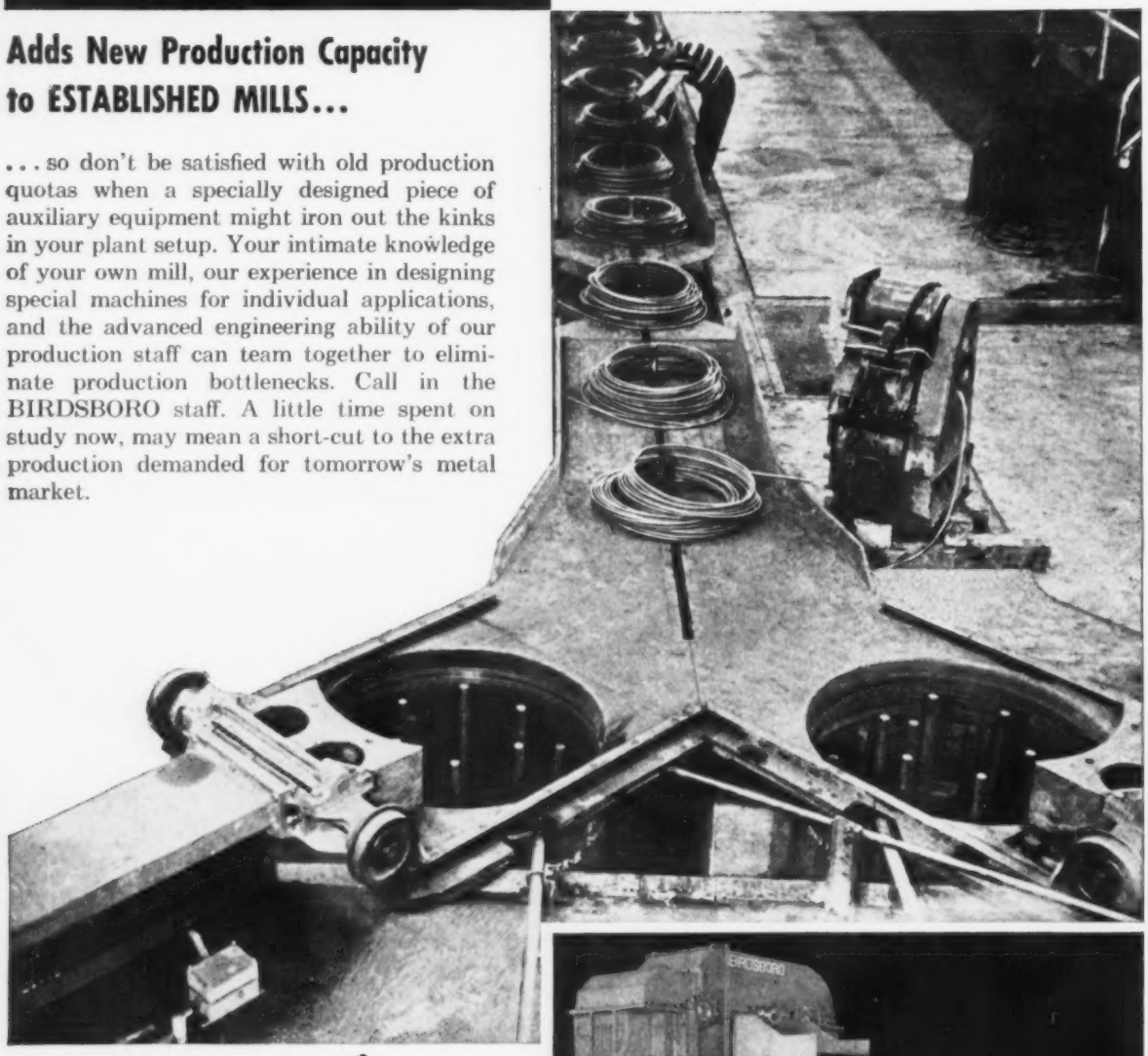
SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

The most silent rolling contact bearing in the world of today

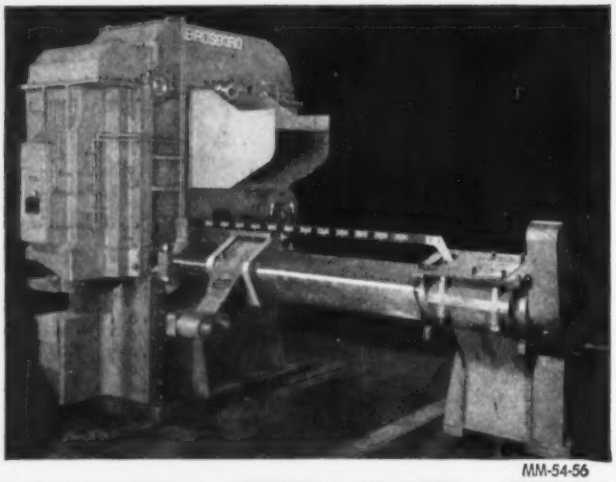
BIRDSBORO Auxiliary Mill Equipment

Adds New Production Capacity to ESTABLISHED MILLS...

...so don't be satisfied with old production quotas when a specially designed piece of auxiliary equipment might iron out the kinks in your plant setup. Your intimate knowledge of your own mill, our experience in designing special machines for individual applications, and the advanced engineering ability of our production staff can team together to eliminate production bottlenecks. Call in the BIRDSBORO staff. A little time spent on study now, may mean a short-cut to the extra production demanded for tomorrow's metal market.



20"-18"-14"-12"-10" Combination Mill Rod Coilers and Rod Coil Conveyor.



This 350-ton Birdsboro Up and Down Cut Shear and Gauge is used for hot shearing of 8" x 8" carbon steel blooms.

DESIGNERS AND BUILDERS OF:

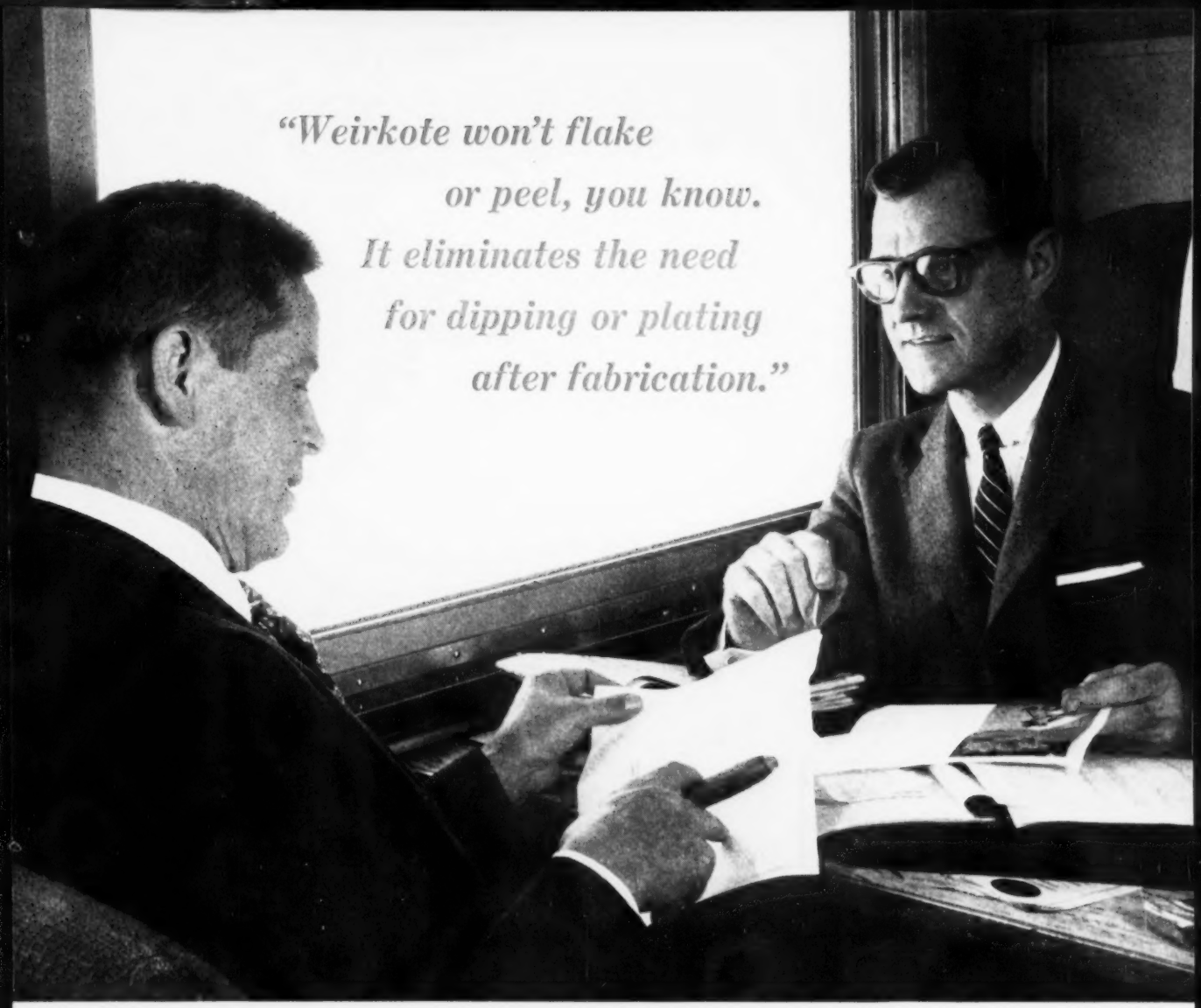
- STEEL MILL MACHINERY
- HYDRAULIC PRESSES *(Metalworking and Extrusion)*
- CRUSHING MACHINERY
- SPECIAL MACHINERY
- STEEL CASTINGS
- Weldments "CAST-WELD" Design
- ROLLS: Steel, Alloy Iron, Alloy Steel

MM-54-56

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., Main Offices in Birdsboro, Pa. District Office: Pittsburgh, Pa.

New York Office: **Engineering Supervision Co.,** *120 West 42nd Street, New York 36, N.Y.*



Q.—Weirkote . . . name's familiar. A zinc-coated steel, isn't it?

A.—*Yes, but with a whale of a difference. Weirkote is made by the continuous galvanizing process. Not the old pot-dip way. Its zinc coating is* bonded *skin-tight for keeps. And what an advantage that is!*

Q.—We're using an uncoated steel now, and dipping after fabrication. Even then we have trouble getting a 100 percent coating on some of our more complicated parts. Can Weirkote help us?

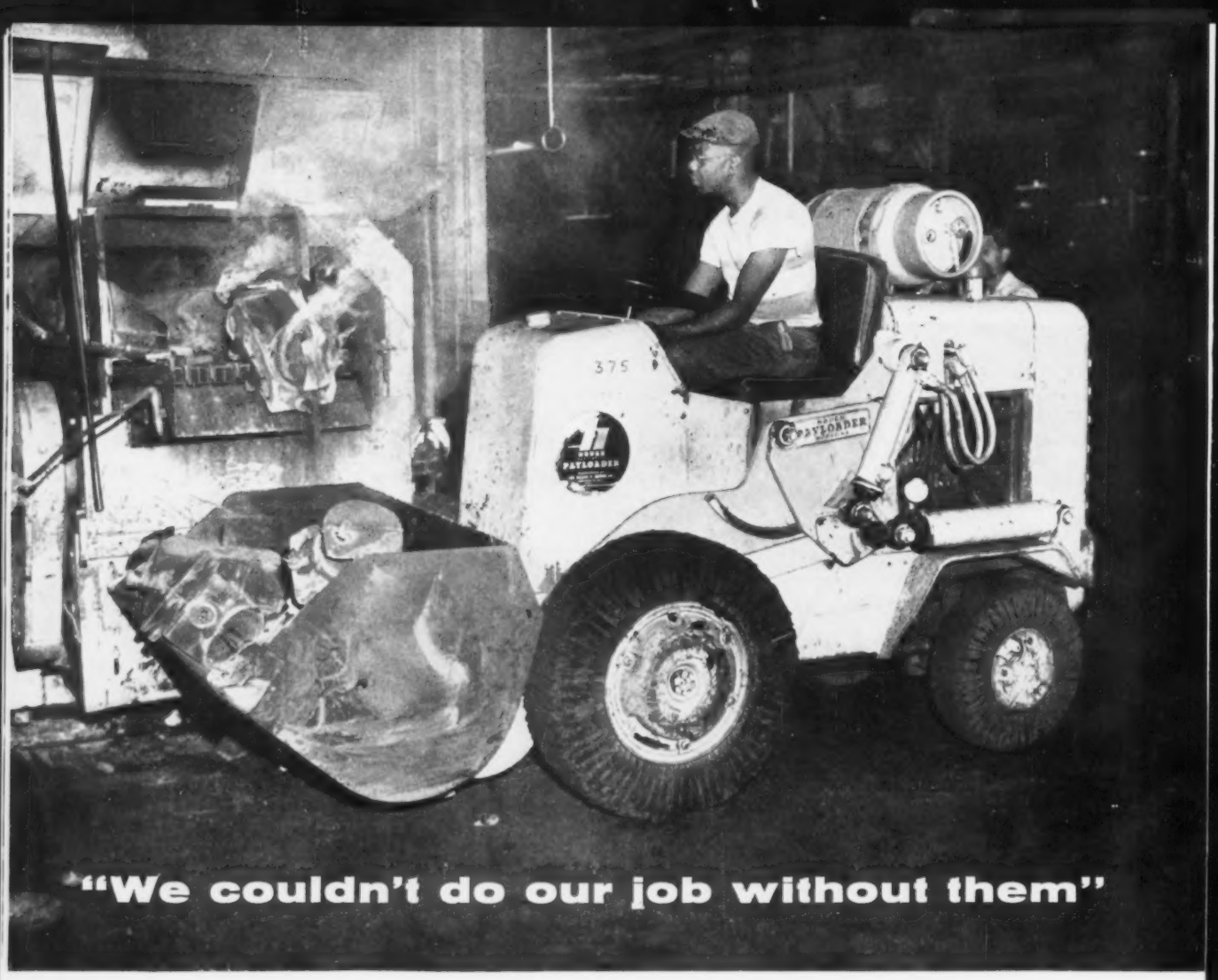
A.—*You bet—Weirkote's zinc coating stands up under the worst fabrication beating you'll want to give it. Shoot the works—stamping, punching, deep drawing, bending, twisting. Weirkote stays put. Stays uniform. Just won't flake or peel.*

Q.—Sounds like Weirkote may be the answer to a lot of our problems.

A.—*Try Weirkote, by all means. You'll never regret it. Weirkote is one of the shortcuts to economy* and *quality in your business and ours.*

Send today for free booklet that details the time- and cost-saving advantages of using skin-tight zinc-coated Weirkote. Write Weirton Steel Company, Dept. A-2, Weirton, West Virginia.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION



"We couldn't do our job without them"

Robert Shea, Crouse-Hinds' foundry engineer says, *"This type of shakeout operation could not be carried out without the services of the 'PAYLOADER' units. Due to the versatility and ruggedness of the 'PAYLOADER' tractor-shovels we were able to install molding systems which increased production 30% and substantially reduced risks of injuries from lifting and handling hot castings. We couldn't do our job without them."*

Crouse-Hinds Company, Syracuse, N.Y., is a foremost manufacturer of electrical equipment including conduit fittings, floodlights, airport lights and traffic signals. In its foundry, three model HA "PAYLOADER" tractor-shovels play an important part in an ingenious and efficient production line.

During the pouring operations, these versatile tractor-shovels stand by the end of the pouring-conveyor line. As fast as the jackets are removed, the molds are pushed from the conveyor into a "PAYLOADER" bucket and are carried and dumped on the shakeout. As the castings come off the end of the shakeout they drop into a waiting "PAYLOADER" bucket, as shown in the illustration, and are whisked away to the core-knockout room. These three model HA's also deliver sand from the mixer to the molding stations.

A variety of extra attachments are available to interchange quickly with its bucket and enable the model HA to do other useful jobs — tine bucket, lift fork, pick-up sweeper, castered scrap hoppers. A nearby Distributor is ready to demonstrate what a model HA or a larger "PAYLOADER" can do for you on *your* jobs.

THE FRANK G. HOUGH CO.
733 Sunnyside Ave., Libertyville, Ill.

- ☐ Model HA (1⅛ cu. ft.) and HAH (1 cu. yd.)
- ☐ Larger models up to 2¼ cu. yd.

Name _____

Title _____

Company _____

Street _____

City _____ State _____

78

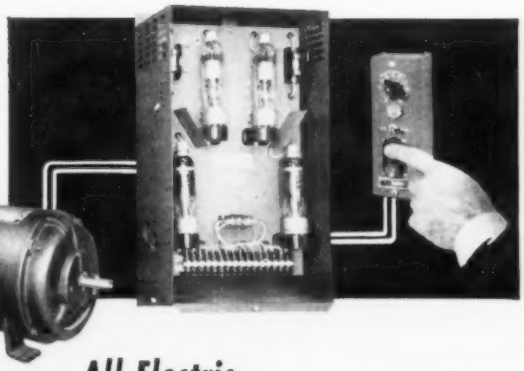
SAY "HUFF"

PAYLOADER®

MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

New!

RELIANCE V★S Jr.



All Electric
Variable Speed Drive
with Finger-tip Control

The new V★S Jr. gives you instantaneous speed changes, even under load, without belts, pulleys, or gears. This Reliance Drive puts complete machine control at the operator's fingertips. All functions, jog, start, stop, reverse and speed changes are placed in a compact, remote control station.

The 8 to 1 motor speed ratio puts extra flexibility into your machinery. Speeds may be changed through this wide range as frequently as required. The motor will operate through a 100 to 1 speed range for jogging or light intermittent duty.

There's a big power cushion in the motor too . . . power for smooth speed pick up, even under heavy shock loads, and dynamic braking for fast controlled stops without shuddering or jerking.

The Reliance V★S Jr. is your answer to machinery drive problems in the ¾ to 4 horsepower range. Package construction makes installation easy; just plug it in to a single phase 220 or 440 volt a-c. line.

Write for Bulletin D-2505 for complete details. D-1554

RELIANCE R ELECTRIC

AND ENGINEERING COMPANY
DEPT. 210A, CLEVELAND 17, OHIO
CANADIAN DIVISION: WELLAND, ONTARIO
Sales Offices and Distributors in principal cities

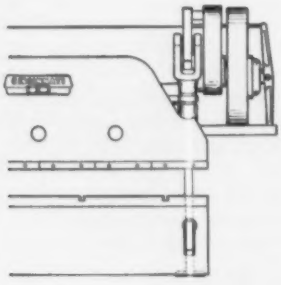
DETREX CHEMICAL INDUSTRIES *say:*

"Our sheet metal department is built around Cincinnati Shears and Press Brakes."

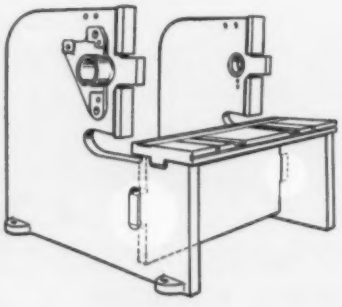
Three Cincinnati Shears and two Cincinnati Press Brakes are operating profitably in this finely equipped shop. All of the sheet steel parts needed to fabricate an entire line of drycleaning equipment are produced on these versatile machines. The materials range in thickness from No. 16 gauge to $\frac{3}{8}$".

An interesting feature of this application is the adjustable handling "table" made by inserting ball-transfers into prepared holes in the plant floor. Plugs cover the holes when they are not being used. This system solves the problem of getting a variety of pieces from the Shears to the Press Brakes.

Centerline Loading is a standard feature of all Cincinnati Press Brakes. Since working forces are contained directly in the housings, weaving of the frame and cramping of the ram slides, guides and shaft bearings are eliminated. Centerline loading makes it possible to concentrate most of the weight of a Cincinnati Press Brake in the four main members, which provides maximum strength per pound of machine. Write Department B for Catalog B-5, which gives full details.



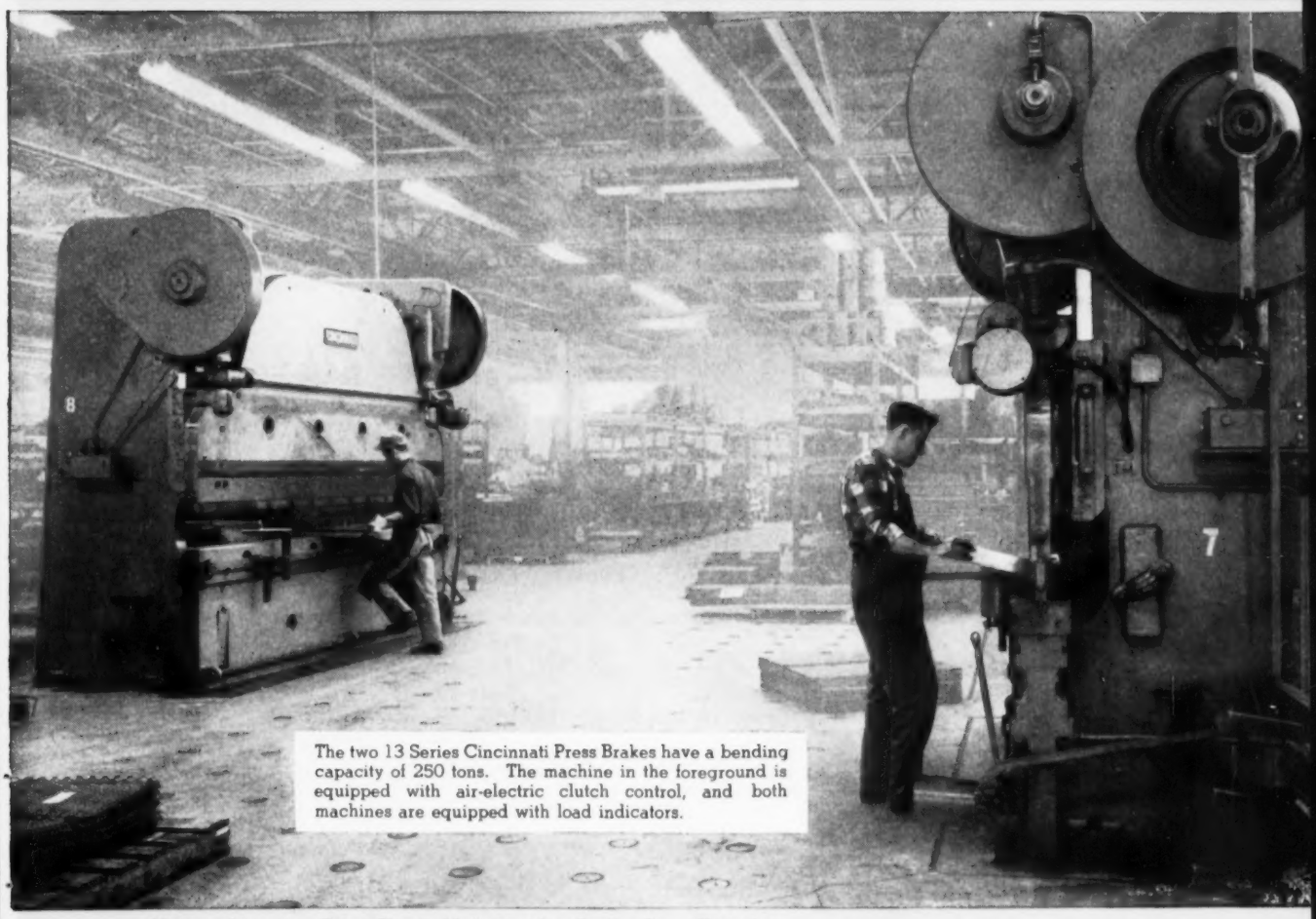
All-Steel, Interlocked Construction is a standard feature of Cincinnati Shears. All the main members are of rolled steel plate, yet no welds are used as load supports. In addition to eliminating strains which affect accuracy, Cincinnati interlocked construction also reduces freight, foundation and installation costs. Write Department B for Catalog S-7R, which gives full details.



THE CINCINNATI SHAPER CO.

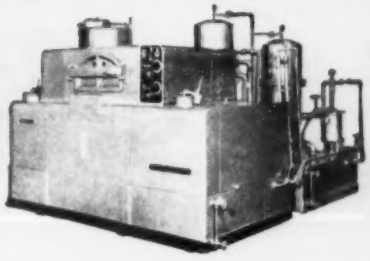
CINCINNATI 25, OHIO, U.S.A. SHAPERS · SHEARS · PRESS BRAKES

The 2510 Series Shear at the left has a capacity of $\frac{3}{8}$" x 10' mild steel. The 1410 and 1406 Series Shears at the right have capacities of $\frac{3}{16}$" x 10' and $\frac{1}{4}$" x 6' mild steel respectively.

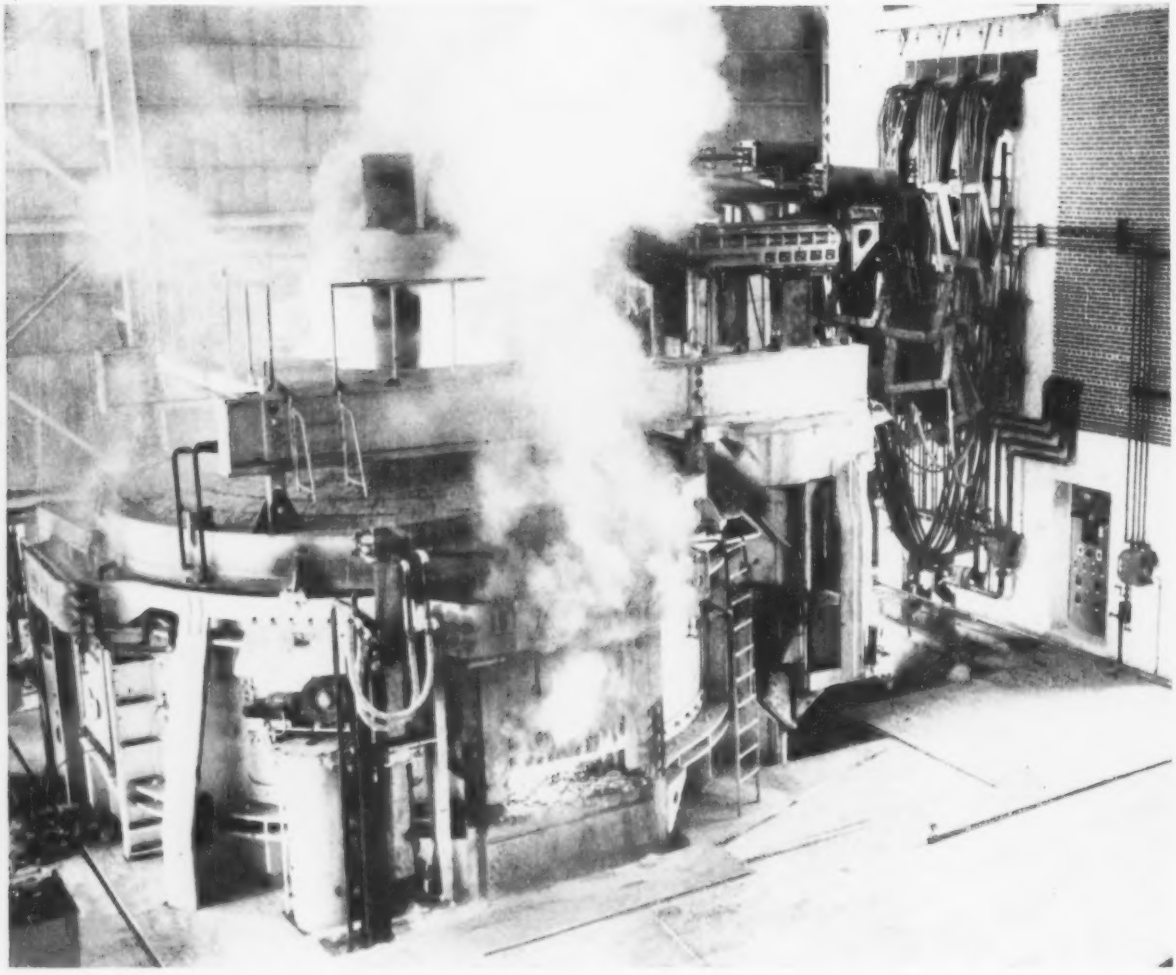


The two 13 Series Cincinnati Press Brakes have a bending capacity of 250 tons. The machine in the foreground is equipped with air-electric clutch control, and both machines are equipped with load indicators.

Photographs courtesy Detrex Chemical Industries, Inc., Bowling Green, Kentucky.



This two-bath Ambassador Model 600S drycleaning machine is typical of the Detrex line of quality equipment produced with the aid of Cincinnati Shaper Company machines.

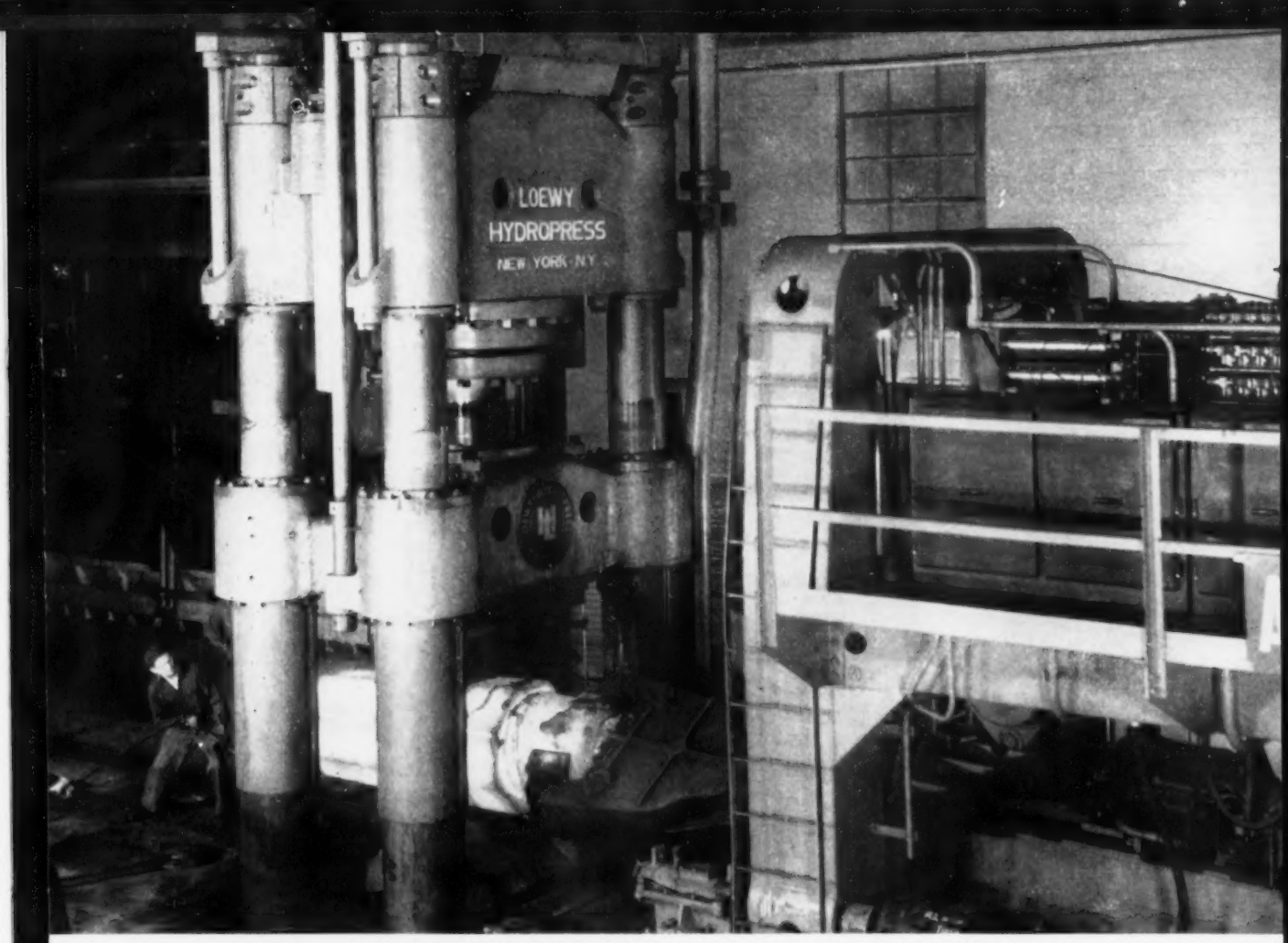


200-ton heats for 24-foot Lectromelt Furnace in Southern steel plant

First of two 24-foot Lectromelt furnaces installed to expand metal making facilities in a Southern steel plant. Present heats run 180 tons . . . 200-ton heats planned in the near future.

Lectromelt®

Catalog 9-B describes Lectromelt Furnace equipment. For a copy, write Lectromelt Furnace Division, McGraw-Edison Company, 512 32nd Street, Pittsburgh 30, Pennsylvania.



Loewy-Hydropress fast-acting 2000 ton hydraulic forging press in operation at Universal-Cyclops Steel Corporation.

"This fast-acting 2000 ton hydraulic forging press imparts to special steels internal qualities never before achieved"

That's the conclusion of Universal-Cyclops Steel Corporation, a major producer of specialty steels since 1884, as to its Loewy water-hydraulic forging press.

Driven by air-loaded accumulator and equipped with oil-hydraulic effortless servo controls for both normal forging and planishing, this press was designed for extreme eccentric loading and highly economical production—like all Loewy-Hydropress equipment. Note the oversize columns, which have no reduction in area at points of maximum flexure. Due to faster displacement of metal and fewer reheats, Loewy high-speed open forging presses can outproduce hammers in working specialty alloy steels.

Loewy designs and builds open and closed die forging presses, Marform rubber-pad deep drawing presses, extrusion presses, rolling mills, and any other special machinery for hot and cold forming of steel and nonferrous metals. And because Loewy has at its disposal the vast, smoothly integrated facilities of the entire Baldwin-Lima-Hamilton Corporation, you are assured of delivery on time.

For specific information, write Dept. A-10.

Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON

The "RIGHT COMBINATION" for every reinforced grinding wheel

. . . because Norton builds the "TOUCH of GOLD" into it

For every grinding, cutting-off or slotting job where you need a reinforced wheel, there's one Norton wheel that will do it best.

Norton helps you make more money by supplying a complete line of reinforced wheels. You get the size, the abrasive, the reinforcing web and the rubber or resinoid bond best suited to the work. Such a wheel puts the "Touch of Gold" in your hands for better production at lower costs.

. . . because Norton builds in Strength and Safety

These pages can't begin to show the many combinations to be found in Norton Reinforced Wheels, mounted wheels and points and sticks.

Norton makes so many varieties you can enjoy the just-right combination you're after. This "combination" lets you work fastest . . . safest . . . and most profitably. It's your advantage in dealing with the world's largest supplier of abrasives.

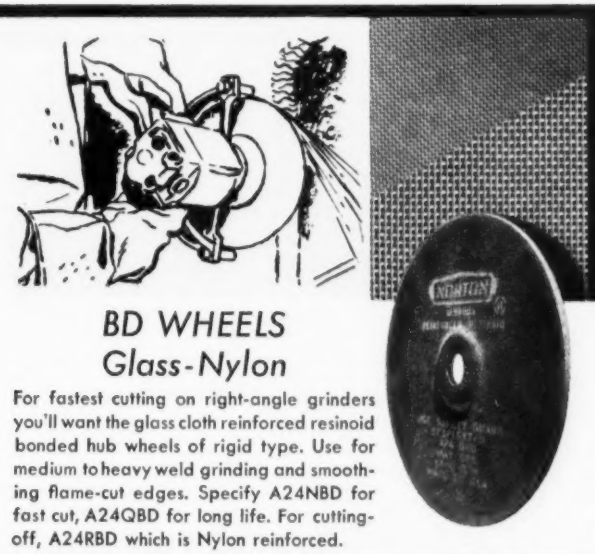
NEW

RN WHEELS
Glass Cloth

New — for the foundry and lower priced! Norton has been field-testing a new rubber-bonded-reinforced wheel. It's ready now and well worth your investigation for savings in your cutting-off operations on ferrous and non-ferrous metals.

BN WHEELS
Glass Cloth

Ten inch diameter wheels can now be had 1/16" and 3/32" thick. In this range specify A36TBN. For heavy duty work, requiring larger, thicker wheels, specify A24R14BN. Use them for slotting, for cutting-off non-ferrous metals, wire rope, many non metallic materials.



BD WHEELS
Glass-Nylon

For fastest cutting on right-angle grinders you'll want the glass cloth reinforced resinoid bonded hub wheels of rigid type. Use for medium to heavy weld grinding and smoothing flame-cut edges. Specify A24NBD for fast cut, A24QBD for long life. For cutting-off, A24RBD which is Nylon reinforced.

BFR WHEELS
Cotton-Nylon

Top performers for light, portable grinding. These semi-flexible resinoid wheels have cotton fabric with an additional layer of Nylon for added safety. Specify A24KBFR for weld smoothing, removing scale, light finishing, minor cut-off jobs, etc.

BF WHEELS
Cotton

These resinoid straight wheels with cotton fabric reinforcement are "the right combination" for peripheral grinding, do a fine job of deburring and finishing. Fine for blending and smoothing light welds. Also available in mounted wheels and sticks.

W-1809

Also, Reinforced Mounted Wheels and Sticks

See your Norton distributor for further facts about reinforced abrasive products. Ask him for Booklet No. 1748. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors all around the world.

NORTON

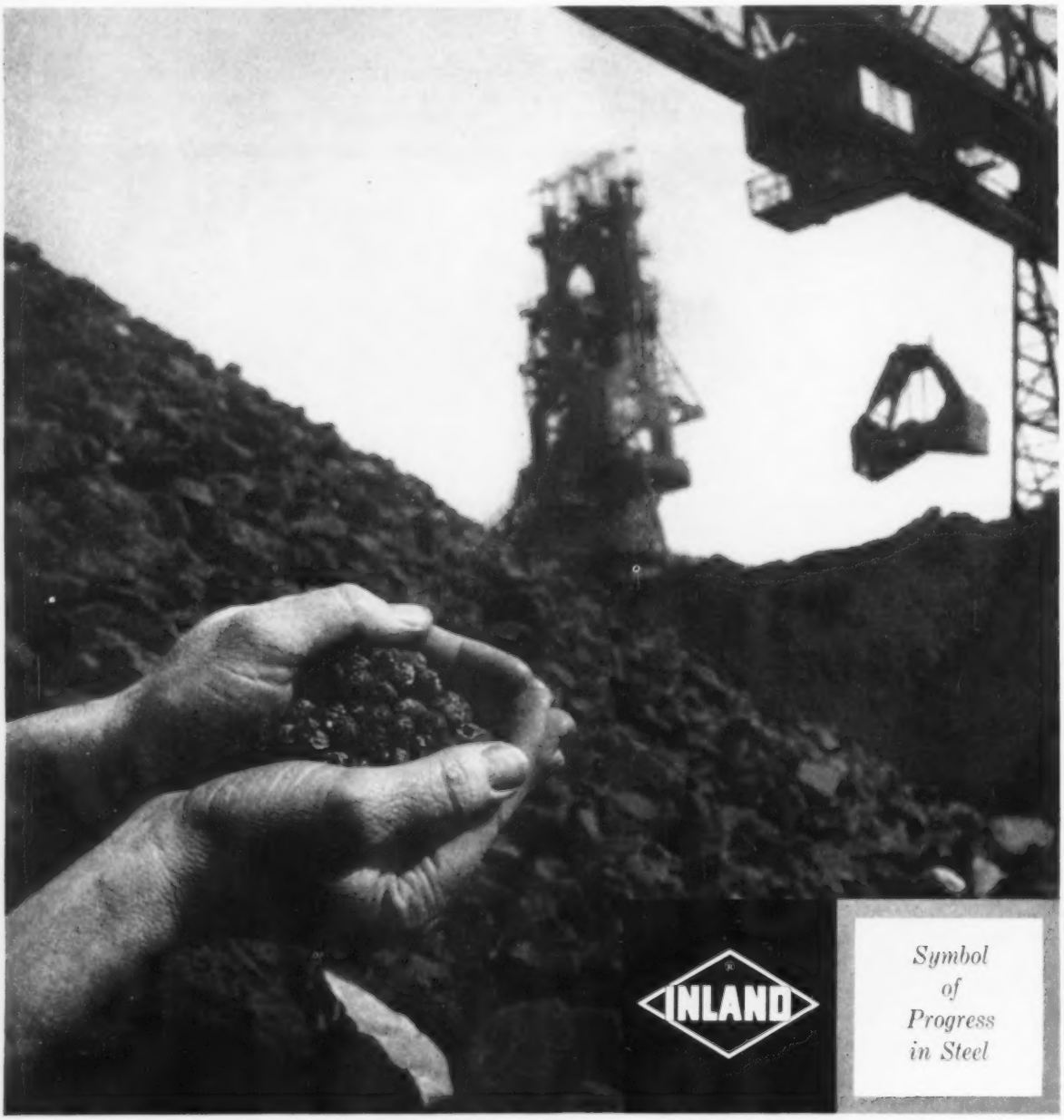
ABRASIVES

Making better products... to make your products better

NORTON PRODUCTS
Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION:
Coated Abrasives • Sharpening Stones • Behr-cat Tapes

Steel Seeds

These "seeds" are actually pellets made from jasper iron ore. They're significant because they represent an important new source of iron for Inland furnaces and, hence, for midwestern metalworking. Once considered to be of no metallurgical usefulness because of low iron content, northern Michigan jasper has assumed new value as steelmen have learned to improve on nature through beneficiation processes. These pellets, for example, assay as high as 65% iron. Though iron ore supply may seem remote from your everyday problems, it is in the forefront of Inland's thinking as we plan ahead to serve better the needs of midwestern steel users.



INLAND STEEL COMPANY • 38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport • St. Louis • Kansas City • Indianapolis • Detroit • New York

Ore Shippers Look Ahead

Great Lakes shippers, nervous about dwindling reserves of rich Mesabi iron ores, are quietly checking the probable strength of the taconite ore business. Market research is aimed 10 years ahead. Preliminary studies indicate a good traffic potential for taconite, but skittish shippers want more details, are expanding their probe.

UAW Learns New Trick

The automotive industry has generally adopted electronic processing of payrolls, production scheduling and cost data. With an eye on next year's bargaining sessions, the UAW is training its own specialists in computer techniques. Their knowhow may be used as a lever to pry out hitherto inaccessible management data on labor costs and profits.

Atoms Losing Appeal?

Most big names in the atomic reactor field are either losing money on their nuclear work, or barely showing a profit. Because decent profits now seem further away than they did a few years ago, the frantic rush to get into such work has leveled off. But work on instruments, isotopes and some hardware items can be good business right now.

Oil From Steel Mill Gases

Steel mills are being approached with a plan that would set up an independent plant for refining coal tar gases. New refining techniques are raising the purity standards of oils recovered. Two major mills have recently installed their own refining plants. For others, an independent refinery, which would service a number of mills, might be the best answer to certain cost problems.

New Trade Association

More than 30 firms, mostly subcontractors in the budding missile and rocket business, are forming their own trade association. Shift from planes to missiles, and resulting fight by aircraft firms to hang onto missile manufacturing, is partly responsible. New group will probably headquarter in Washington, is tentatively called the National Rocket & Missile Industries Assn.

Watch Vacuum Diecasting

A major campaign is being readied to tell prospective buyers about the advantages of vacuum-diecast aluminum parts. Diecasting equipment in present plants can be readily converted, or all new equipment can be installed. One of the big aluminum producers has two new alloys ready for the expected boom. Castings gain strength by being nonporous and are said to take a beautiful anodized finish. Auto producers are holding top-level confabs about taking the plunge.

Warehouse Bucks Tide

There are hints that mill warehousing of cold finished bars will gain strength. The 24-hour delivery performance of one firm has boosted its sales 8 pct over year ago levels. And this has been done in an area where cold finished bar sales generally are far below what they were last year at this time.

To Show Building-Blocks

Practicability of building-block machine tools for automated setups will be demonstrated soon when the newest engine plant of a major automotive firm is thrown open to newsmen. Word is that the new plant (in Ohio) represents the most standardization yet achieved in machine tool components for a transfer line. The building block concept has been gathering steam slowly, could surge ahead much faster after the upcoming demonstration.

Ponder Steel Freight Rate

Railroad executives are debating whether to ask higher freight rates on iron and steel products. They will seek steeper fees on a number of other commodities, but they're edgy about iron and steel. Having lost some of this business to truckers, the railroads don't want to drop any more.

Farval serves 1133 mill and crane bearings in Atlantic Steel's new bar and rod mill

FARVAL—
Studies in Centralized Lubrication
No. 205

KEYS TO ADEQUATE LUBRICATION—

Inset above shows Farval automatic pumping station No. 3, serving 240 points on 15 horizontal mills, edging mill, furnace switch and pullout. Above you see *Farvalized* overhead crane and runout tables in the Atlantic Steel Co. mill room.

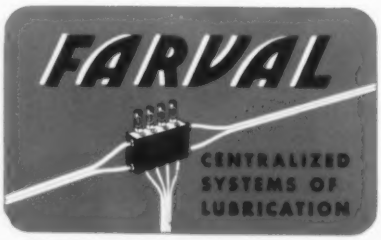
● Last word for modern machines and manufacturing practice, this Atlanta steel company also employs the most modern method of lubrication—Farval Centralized Lubrication. Twenty-four Farval systems keep mills and cranes running smoothly, serving a total of 1133 bearings.

You'll generally find Farval in evidence wherever steel is made or worked. Literally thousands of systems, automatic and manually operated, protect millions of bearings in the metals industries—some of them still efficiently on the job after 25 to 30 years of service.

Farval is the original Dualine system of centralized lubrication that delivers measured amounts of oil or grease under pressure to every bearing as often as desired. No bearing is ever missed.

Write for newly revised Bulletin 26-S, which tells the whole Farval story. The Farval Corporation, 3282 E. 80th St., Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



SPECIAL REPORT

Diversification: Is It Always the Answer?

By J. E. Martin—Pres., Dana Corp., Toledo

Diversification is a currently popular method for planning company growth.

But it may not always be the soundest course to follow for the long-range pull.

Here are some alternatives growth-minded companies should consider first.

■ Calling the shots on a company's future isn't an easy job. But many executives are on such a firing line today. They know that to stand still is to fall backward. And to pick up ground means moving at a faster pace than their competitors.

But what is the best way to plan for future growth?

Today's decisions won't be tested for many years to come. The payoff for stockholders, employees and the management lies in the future. So a program that doesn't set a growth pattern for at least ten to twenty years isn't really planning at all. It's taking a chance on a temporary situation.

Ways To Grow—There are several ways a company can grow. Diversification seems to be the most popular at the moment. In fact, it's almost become a business fad. Bigger companies buy smaller ones, and vice versa; stock in one firm is traded for stock in another; tax-loss situations are eagerly sought; wholly unrelated product lines are added.

The question is, where will it end twenty years from now? And is this the best road to travel for sound future growth?

Now, I'm not against diversification. Dana Corp. has bought two companies and plants in the last ten years. We've also manufactured new products for other fields. And about 25 pct of my time is spent in studying new company or plant acquisitions—not all in the automotive parts industry, either.

When To Buy — The kind of diversification I question is that which brings only the chance for temporary profit to a company; which has no logical tie-in with a firm's management skills, marketing concepts or engineering know-how.

Unless a product or line of products can be produced more profitably than formerly, there's no sense taking them over. This is buying for investment—not long-range growth. If that's the case, then it's better to put the money in government bonds or an investment trust. The return is as good and it's much safer.

Of course, there are reasons which make diversification a must. Most common of these are:

1. Survival—This is where technological advances wipe out a company's market. It has to switch to another item or line or be forced out of business.

Find New Products—Let's take an example from my own industry. Suppose air suspensions become standard equipment on all automotive vehicles. Present makers of leaf and coil springs and torsion bars will be finished if they don't seek new items to manufacture.

J. E. (Jack) Martin heads up one of the most profitable firms in the auto parts industry. From 1946 to 1956 Dana's sales climbed from $46 to over $225 million a year. This volume is largely in the automotive field. Here, Mr. Martin gives his views on what companies should consider in planning future growh.

A more realistic case has seen automatic transmissions replace conventional clutch and gear arrangements on almost all new-model passenger cars.

2. Balanced Production — Here seasonal variations come into play. Companies catering to a seasonal market strike a production imbalance at certain times of the year. Other items are taken on to minimize temporary layoffs and assure a stable work force.

A classic example from a gen-

"A program that doesn't set a growth pattern for at least ten to twenty years isn't really planning at all. It's taking a chance on a temporary situation."

"Unless a product can be produced more profitably than before, there's no use taking it over. This is buying for investment — not long range growth."

"Any number of companies have diversified successfully . . . But in many cases they had what we call 'one foot in the bucket'."

eration ago is the ice distributor going into the coal business during the winter months.

3. Marketing Requirements—Today's merchandising methods often call for incorporating a number of different products into a complete line—if any one of them is going to sell. Major household appliances are typical. We've all seen the many mergers and acquisitions which have taken place here in the last five years.

Aside from this, there are any number of companies which have diversified successfully and built a solid foundation for future growth. But in many cases they had what we call "one foot in the bucket."

Somewhere along the line they had something to offer which wasn't there before. They either knew how to sell the products better or make them at a lower cost. In other words, because of the nature of their own company they could boost the volume or increase the profitability of the purchased company, line or product.

However, the safest road to travel for successful company growth is the one a firm knows best. I love golf and play as much as I can. But if my game is off I don't take up tennis as a hedge. Neither should a company.

As long as a firm can grow within the limits of its available funds (retained earnings, depreciation allowances, credit, stock issues, etc.), it should stick to its own game.

Use Capital—This means making full use of the capital at its disposal (after necessary safeguards are taken care of) to modernize plants and equipment, prune costs and selling prices and keep in the best competitive condition possible. There's no use holding on to a bag of chips if someone else is going to cash them in.

With this basic view it's easier for a company to analyze its growth possibilities and plan future strategy.

Generally, there are four ways for a company to grow. The three ways to consider first are growth through: market penetration; market development; and new product development. Let's take a look at them to see what they involve:

1. Market Penetration—Here a company plans to get a bigger cut of the pie, by selling more of its products to the same or a larger number of customers. Planning in this area calls for a long range forecast of the future market.

If the outlook is good, then manufacturing and sales should gear up to go after the market when it starts to come in.

2. Market Development—If long-range forecasts for present products don't show a healthy growth trend, then it's best to start laying the groundwork for broadening the market in the same general area.

This can be done by adapting present products, perhaps with minor modifications, to a new class of customers. Dana, for instance, has done this with some parts once slated only to automotive customers. They are now being sold to the farm implement, earth moving machinery and aircraft industries.

3. New Product Development—This is where research and engineering skills can really pay off. Firms should redouble their efforts to develop new products to meet the needs of its industry.

Out of this may come an entirely new proprietary product not geared to an immediate need—but unlike

"The safest road to travel for successful company growth is the one a firm knows best. I love golf. But if my game is off I don't take up tennis as a hedge."

anything on the market before. Our Powr-Lok differential for passenger cars is a case in point. This unit automatically transfers power to the car wheel with the most traction, makes it easier to pull a car out of sand, mud or snow.

Diversification is the fourth and last alternative to consider in planning for future growth. It means departing from established product lines and market areas. The risk is greater and the chances for success are slimmer.

Some well-known companies have backed away from diversification programs because they didn't work out for them. Other programs must wait a few years for a real test.

Everything might work out well in the long run. But it's like a captain heading out on an uncharted course. I'm sure he'd prefer a ship he knew how to handle and a crew he could count on in a rough sea.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Wire Makers Fight Import Challenge

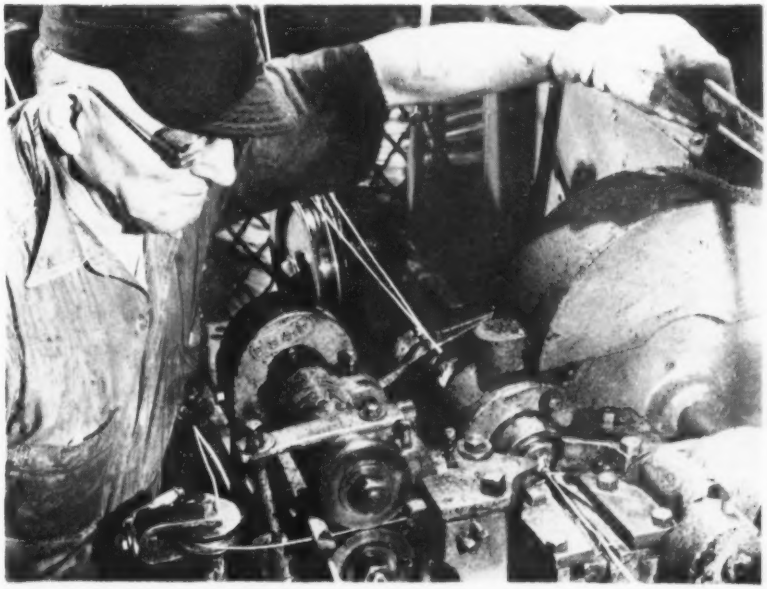
▪ U. S. wire producers are using their technology to fight the flood of lower-priced imported barbed wire cutting into their sales in the farm country.

Latest weapon is high tensile strength wire which in a thinner 13½ ga. size has the same breaking strength as standard 12½ ga. But it sells for about $1.25 per cwt less, or closer to the lower-priced foreign product. Both will hold about 1100 lbs. dead weight.

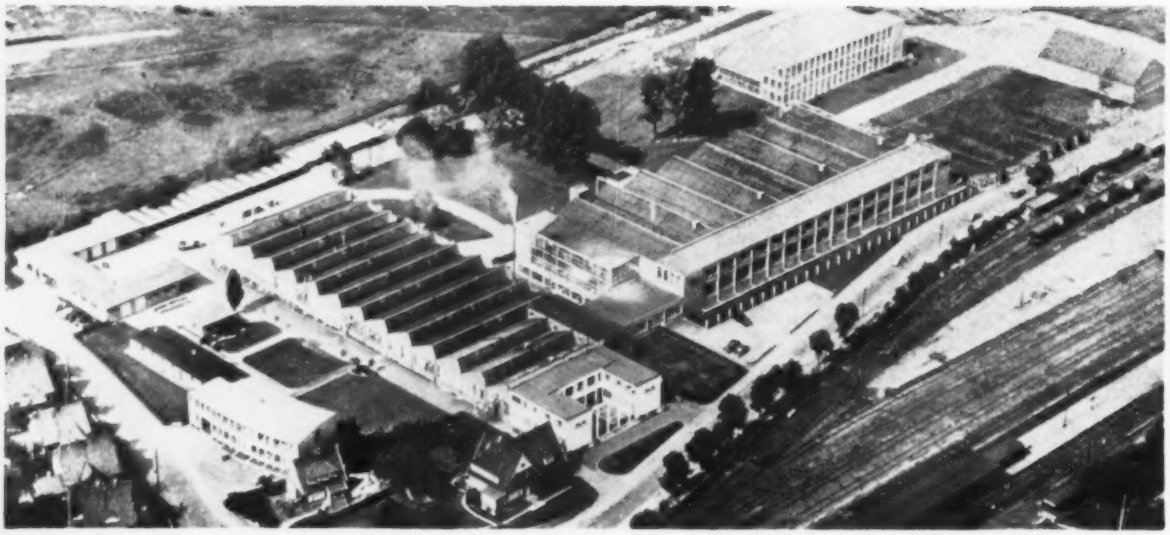
Properties Improved—The tensile strength was raised metallurgically from standard 75,000 psi to the 90,000-105,000 psi range. And the brittleness was overcome by improved heat treating. Coatings have also been strengthened where possible.

First firm to introduce the new high tensile wire was Armco Steel's Sheffield Div. at Kansas City, Mo. last May. Others now turning it out on a production basis are American Steel & Wire Div., U. S. Steel, Republic, Northwestern, Colorado Fuel & Iron Corp., Keystone and Continental. This is about half the total U. S. producers, and others will probably jump on the bandwagon soon.

Newell Comments — W. S. Newell, general manager of sales, Sheffield Div. said, "Because this new type barbed wire is stronger, easy to handle, and sells within a price range that effects important savings to farmers and ranchers, it has met with immediate acceptance. We feel that by developing Sheffield "100" barbed wire we have led the way for other domestic producers in meeting a challenging and serious competitive problem, and have performed a service to American farmers and ranchers."



STRONGER: American wiremakers, including American Steel & Wire Div., U.S. Steel Corp. are offering a higher tensile strength barbed wire.



GOING ABROAD: Rockwell Manufacturing has purchased Ilo-Werke, above, to by-pass some problems of export.

Hurdling the Export Barriers

European trade unification, tariffs, quotas, and high American labor costs are stumbling blocks for U. S. exporters.

One solution: Rockwell Mfg. Co. bought an existing plant in West Germany to manufacture there.—By G. J. McManus.

▪ Are American exporters in danger of being squeezed out of Europe?

It's a very real possibility, according to a company which has 10 pct of its business in export. However, the firm feels it has found a solution to the problem.

Rockwell Manufacturing Co., Pittsburgh, has just bought a plant in West Germany. For $2 million Rockwell acquired Ilo-Werke, a 1200 man organization with factories in Munich and outside Hamburg. The German company makes motor vehicle and industrial engines. Rockwell will add a valve plant on land acquired in the deal; it is considering power tool and meter production.

Go to the Market—In explaining the move, Rockwell officials point out three factors: 1. Europe provides a big, important market. 2. Tariffs, quotas and high labor costs place American manufacturers at a disadvantage in this market. 3. Proposed plans for the trade unification of Europe may further weaken the American position.

Effects of these conditions were summed up by Willard F. Rockwell, Jr., president of the Pittsburgh company. He said they "will make it all but impossible for American manufacturers to share in this mass market . . . unless the Americans actually own and operate plants within the area itself."

Mr. Rockwell's mass market is a 12-nation group that takes in Great Britain, West Germany, Scandinavia, the Benelux countries, France, and others. It includes 250 million people with purchasing power two-thirds that of the United States.

Rough Road for Outsiders—Even without European trade unification, competition there figures to stiffen. For one thing import quotas are already small on many products. Rockwell can send only $1200 worth of power tools into France each year. This situation could grow worse as Europe increases its production. Gross national output jumped 8 pct in Germany last year; 4 pct in France; 4 pct in Belgium and in Austria.

The potential cost advantage of a European producer is staggering. Rockwell reports these wage differentials between its domestic and West German operations: A German toolmaker draws 57¢ an hour and works a 9-hour day. Same job in America brings $3 an hour with overtime after 8 hours. Average plant wages are 46¢ an hour in Germany against $2.20 an hour in this country.

Market Insurance — This cost edge not only gives the European company a running start at home but makes it a growing factor abroad. Rockwell, for example, has run into tough competition from foreign makers of taxi meters along the East Coast of the U. S.

In setting up a German operation, Rockwell officials admit they are looking for insurance against a time when foreign producers may dominate certain markets in this country and in Latin America.

How Steel Figures Oxygen Costs

It's a Close Make or Buy Decision

Inland and J & L show how they figure their oxygen costs in steelmaking operations.

J & L's analysis is of its own plant. Inland discloses comparative estimates of its own make or buy study.

▪ Steel men got a rare look at a shadowy subject recently when two mills revealed figures on oxygen costs.

At a meeting of the American Iron & Steel Engineers, Inland Steel and Jones & Laughlin trotted out figures covering the purchase and production of oxygen.

Inland buys its oxygen, purchasing about 77,000 tons a year from an outside supplier. J&L at its Pittsburgh works operates its own plant, which has a capacity of about 100 tons a day.

No Rule of Thumb — Neither company is attempting to give a broad, general answer to the question of purchased or homemade oxygen. Each is giving facts for a particular situation.

Inland's story was presented by N. R. Kirkdoffer, superintendent, power steam and combustion departments. He told how Inland had twice reviewed the economics of oxygen making. In 1951 the company's usage reached the point where a tonnage supply system was indicated.

Inland had three choices. It could build and operate a plant with a capacity of 200 tons a day. It could have an outside supplier build and operate such a plant at the mill. Or it could have oxygen piped in from a nearby tonnage plant.

Inland's Picture—Inland's situation was unique in that there was a source of volume oxygen close by. For most tonnage users, the choice is between on site plants operated by either the supplier or the mill. It was on this basis that Mr. Kirkdoffer presented cost figures.

Figuring on a 200 ton per day plant with consumption of 4500 tons a month. Inland came up with costs of $14.91 a ton for a mill operated system and $18.89 a ton for a supplier operated system. With consumption reduced to 3000 tons a month, the company estimated costs at $20.33 a ton for a mill operated system and $26.09 a ton for supplier operation.

Decided to Buy—However the company went the route of purchased oxygen. The cost of building a 200 ton oxygen plant was placed at $2 million. The return on this investment would have been only 5 to 5.2 pct.

Inland's decision was to run an 8-in. pipeline to a supplier 2½ miles away. This method was found to be more attractive financially than either of the other two. Apart from direct savings, this system assured a supply for peak periods.

By 1956, Inland's consumption of high-purity oxygen for general plant use had risen from 20 to 70 tons a day. It again went over the question of building a plant and again decided to go along with an outside supplier.

J&L's Figures — The Jones & Laughlin story was presented by R. A. Lambert, superintendent, steam efficiency and combustion dept., Pittsburgh works. Reporting on a 100-ton plant, he gave cost figures that ranged from about 87¢ per 1000 cu ft at a 100 pct ingot rate to $1.463 with a 50 pct ingot rate.

The J&L plant was built under a lease arrangement. The company pays a lease fee for a period of 15 years. At the end of that time, it takes over the plant and lease charges stop. Mr. Lambert pointed out that this would mean a sharp drop in costs after 15 years.

Oxygen Costs in Steelmaking

J & L On-Site Operating Expense

100-ton per day plant, one month's operation.

	Operating Rate			
	100 Pct	80 Pct	70 Pct	50 Pct
OXYGEN CONSUMPTION (1000 cu ft)	67,530	52,390	43,375	30,690
OPERATING COST (including lease charges)	$58,700	$54,000	$50,800	$44,900
UNIT COST (1000 cu ft)	$0.869	$1.031	$1.171	$1.463
OPERATING COST DETAILS				
Operating Labor	6.7 pct	7.2 pct	7.7 pct	8.7 pct
Maintenance Labor	10.2 pct	9.8 pct	7.5 pct	6.0 pct
Technical Series	0.7 pct	0.6 pct	0.6 pct	0.7 pct
Utilities	38.2 pct	34.2 pct	33.1 pct	26.8 pct
Lease Costs	44.2 pct	48.2 pct	51.2 pct	51.8 pct

Advice for Small Business—

Learn to Use Help That's Available

President's Conference for Small Business is start of broad program to improve utilization of services and aids that are already available.

Many small businessmen would like to see more concrete help in form of lower taxes, more government contracts.

▪ Will small business really warm up to the "do-it-yourself" plan that resulted from the President's Conference for Small Business in Washington last week?

Principal outgrowth of the meeting is a broad general plan to follow up the Conference on Technical and Distribution Research for the Benefit of Small Business, the meeting's official name, with regional, state and local meetings patterned after it.

Too High Level—For direct action, the 1000 conference attenders were handed a booklet, "Organizational Handbook for Regional or City-wide Conferences." Its purpose is to provide a formula for use in their home areas in setting up the follow-up sessions.

This long-range, high-level assistance for small business to help itself may prove effective in the end. But many of the small businessmen would have traded the good advice of the session for some more down-to-earth talk on proposals for tax relief, financial aid, or a bigger share of government business.

Recommendations—As a result of the panel sessions, a special action committee will make specific recommendations to President Eisenhower. Conference panel leaders themselves came up with these general recommendations:

1. Small businessmen need more technical assistance from the government.

2. Local Chambers of Commerce and regional offices of the Dept. of Commerce and Small Business Administration should set up technical advisory boards to serve small business.

3. More stress should be placed on process improvement research, as well as product research.

4. Aid and advice should contain more case histories, rather than theory.

5. Each manufacturer, no matter how small, should have one man whose responsibility is the development of available technical assistance.

6. Small businessmen are advised to finance research and development out of their own resources. Too often, applications for outside financing are turned down, probably leading to abandonment of the project.

Small Businessmen Outnumbered—At conference sessions, small businessmen sometimes found themselves in the minority, outnumbered by representatives of big business, trade association, educators, regional developers, representatives of federal and state government agencies, management consultants, and others.

The reason for the group makeup, since all were invited, was puzzling at first to some. But it

Small Businessmen Weigh Their Assets

Question: If you are doing better than your competition, what is your strongest asset?

Service and Customer Relations	**23.6 pct**
Quality	**20.4 pct**
Ability, Reputation and Experience	**14.0 pct**
Competent Personnel	**5.7 pct**
Equipment and Facilities	**5.7 pct**
Flexibility	**2.9 pct**
New Products	**1.7 pct**
Nothing in Particular	**22.3 pct**
All Other	**3.7 pct**

Source: Dun & Bradstreet Survey

became obvious that if the conference itself is to be the start of a broad program, these other groups are needed to form and organize local conferences.

Conference Organization — The conference was divided into two groups, technical and distribution, and was set up on parallel lines. For example, while the technical group heard discussions of group effort on a regional basis, large business assistance, federal government aids to small business research programs; the distribution group heard a discussion of the assistance national and regional trade and professional associations provide to small business, with supporting case histories.

Workshop subjects, for which conferees volunteered or were assigned, were along the lines of "How to Recruit, Train and Motivate R&D Personnel," or "How Every Manufacturer Can Be His Own Researcher."

Chairman Concedes — Dr. Eric A. Walker, president of Pennsylvania State University, and chairman of the conference, conceded that the conference did not touch on the subjects of primary interest of the small businessmen such as taxes, government contracts, and labor problems.

Addressing the conference at its opening day, President Eisenhower assured the small businessmen that taxes and procurement aids "will not be forgotten, but are not part of your agenda."

As a result of the tone of the conference, it was blasted by a number of senators and congressmen, principally Democrats, who hope to make an issue of the Administration's attiude.

Obstacles to Overcome—Wilford L. White, chief, Managerial Assistance Div., SBA, pointed out "there is only one fellow who can help the small operator. That is the owner himself."

He admitted that much of the government's help in small business "often goes largely unused."

Are Authors Unfair To Businessmen?

American Management Assn. panel considers whether business is being given a black eye.

Authors contend they're concerned with dramatic human situations, not types.

▪ Are authors unfair to businessmen? Are the arts giving the public a false image of the modern corporation executive? Is the organization man a true and inevitable part of modern life?

These questions and their implications were a highlight of American Management Assn.'s fall personnel conference in New York last week.

False Picture?—Introducing the usual panel discussion by businessmen and authors, Charles B. Wade, Jr., personnel manager, R. J. Reynolds Tobacco Co., emphasized that the public's picture of management is largely conditioned by books, movies, theatre, and television. Since American business is ultimately public property, this conditioning can eventually have a real, if subtle, effect on business. Do books such as Cash McCall's "The Man in the Gray Flannel Suit," "Executive Suite," plays like "Death of a Salesman," television dramas like "Patterns" show the businessman as he really is?

Business members of the panel answered with a resounding "no." Modern fiction does not portray management in its proper colors.

Authors' Arguments — The authors countered that writers are concerned with individuals, not types, that business settings are reflections of the importance of business in modern life, not attempts to write definitive works on corporate practice. Top management does wield, or at least represents, enormous power. Authors would be remiss in their reponsibility if they failed to investigate such subjects. But they are primarily concerned with dramatic human situations, and these are by their nature atypical rather than typical.

Business spokesmen also objected to modern authors' seeming ignorance of the true ways of business. The writers countered that some simplification is necessary to develop a dramatic situation. And the problems they are primarily concerned with are universal, even when portrayed against a business backdrop.

A Common Problem—This was underscored by James I. Patin, director, personnel administration, Pennsylvania Railroad. He pointed out that a major theme of today's business fiction is the conflict of principle versus expediency, a problem by no means limited to business.

Rod Serling, author of the controversial TV drama "Patterns," agreed on the universality of literary themes. "Patterns," for example, originally had an Army, not business, background, and was in no sense meant to be typical of either Army or business life. But, he added, within nine weeks after the first showing of his play, he received almost 600 letters asking him the company's name.

Victim or Victimizer — Ernst Pawel, author of "The Dark Tower," countered with his belief that fiction is showing the modern businessman more as a victim than victimizer of his own system. "I think we are making him a sympathetic character."

Behind Creation of Ford's Edsel

The Edsel's controversial front grille is an old idea in modern dress.

Here's the story of how the Edsel's creators struggled to come up with something different, yet salable.—By H. R. Neal.

■ Ford Motor Co.'s new car, the Edsel, has stirred up a bit of controversy among a large group of "amateurs" popularly called "the car-buying public."

The Ford people expected a mixed reaction to their new "baby"—a car that took to the road nine long years after its conception. And whether you like it or condemn it, the men who styled and engineered it from the ground up are satisfied with their brain-child.

It's Got "Character"—Says Roy A. Brown, who headed up the top-flight styling team that wet-nursed the Edsel from dream to reality:

"Front and rear, we had what we wanted: A car that had character—without sticking out like a sore thumb."

Who Decided What!—How did the Edsel's creators settle on the final design and engineering features? What were some of the other ideas that were considered and rejected? In short, is it possible that the Edsel could have emerged from its cocoon in a different form?

The IRON AGE put these questions to George W. Walker, vice president and director of styling, Ford Motor Co., and Mr. Brown, now chief of the Edsel Styling Studio.

Behind the Scenes—Their answers provide a behind-the-scenes glimpse of the thousands of man-hours, creative effort, and mental agony that went into development of the Edsel.

A good idea of "what might have been" can be gleaned from the hundreds of sketches that bloomed and faded as the stylists struggled to come up with something different. A few of these drawings are reproduced on the opposite page.

Horizontal Start—"We actually started with a horizontal theme in mind for the grille," recalls Mr. Brown. "It is the one universally used today, and the one most familiar to our stylists. But it didn't take us long to decide it lacked 'identification.' So it was not for us.

"We worked with a lot of ideas after that—circle, diamond, square. Then we hit on the vertical."

Why the vertical grille—a style that had its fling back in the 1930's?

Vertical Finish—The Edsel designers felt the vertical theme gave several advantages. It is distinctive, yet familiar. Cars still considered as classics in styling have all used the vertical grille.

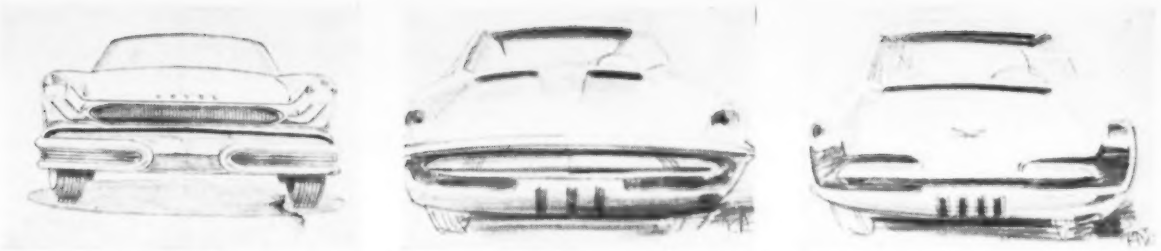
"Our first attempts at interpreting this in a modern way failed to emphasize the vertical enough. An outer impact ring was suggested and added to the vertical section to define the area more clearly. The front end was developing character."

Months of Effort—As the front end evolved, the stylists worked in dual headlights. Bumpers were wrapped around the sides to complement the new lines. Parking lights were moved from the bumpers into the horizontal sections of the grille. With a few more minor refinements, the front end came to life, after months of hard work.

When the smoke cleared, the designers had what they wanted: A car with a personality of its own. They feel the Edsel is a standout, that it can be identified from either front or rear without hesitation and from a greater distance than any other car on the road.

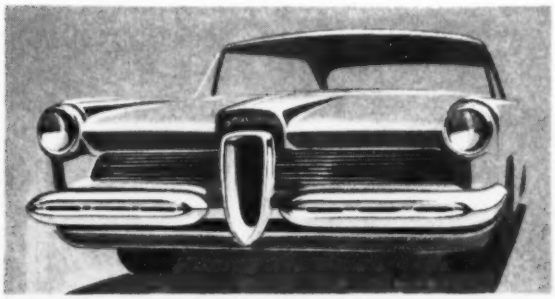
It's Up to Joe Public—Whether the fickle car buyer loves the Edsel as much as its creators remains to be seen. As Mr. Walker confesses: The final judge is the American public. And there can be none sterner.

EDSEL: A car with character without sticking out like a sore thumb.

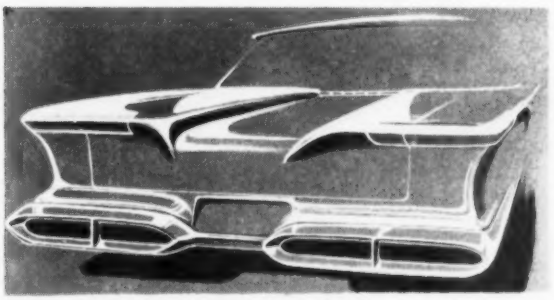


FIRST EFFORTS: "We actually started with a horizontal theme in mind for the grille."

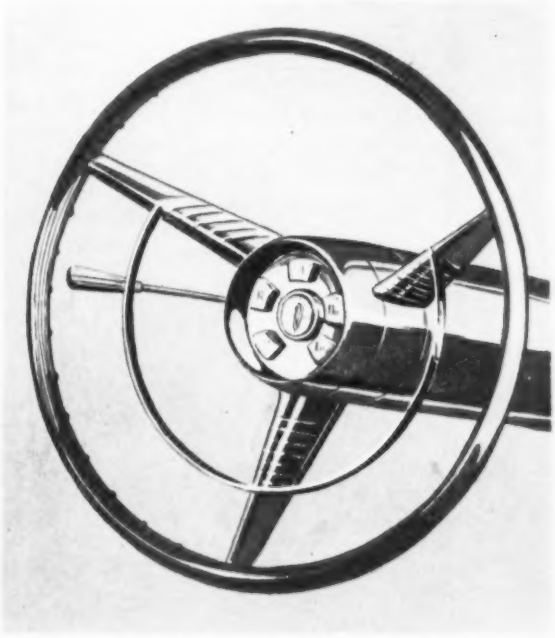
VERTICAL TREND: "We worked with many ideas . . . circle, diamond, square. Then we hit on the vertical."



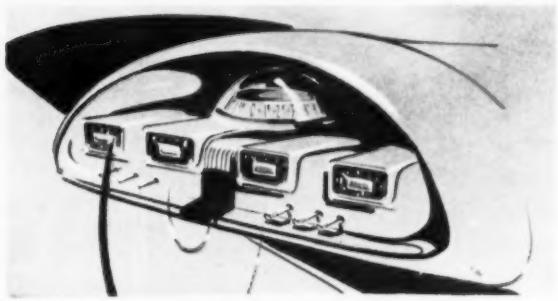
REJECT: "Not enough emphasis on the vertical."



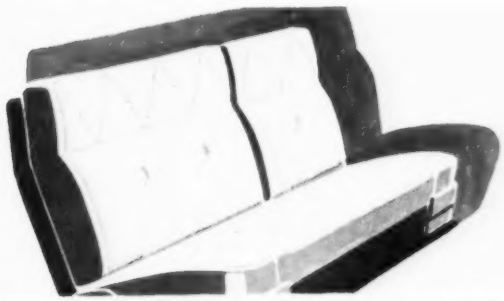
GULL WING: Early version of gull wing effect.



STEERING: Sketch shows push-button gear shift.



DASH: First conception of instrument panel.



DRIVER'S SEAT: "It's simple and comfortable."

Rush Is on for Leased Trucks

More Small Companies Signing the Dotted Line

Even using soft sell tactics, truck lessors are having no trouble finding business.

Firms find they can ship for less than common carrier truck rates.—By K. W. Bennett.

▪ Industry is coming into the truck leasing picture by way of the back door. The reason: Distribution firms offer a red-hot market for the truck leasing idea and are soaking up new fleets almost as fast as they are acquired by lessors.

Accordingly, lessors have been something less than high pressure in going after industrial business. Yet truck leasing does offer advantages to a manufacturer saddled with its own fleet. The release of capital for more productive use is one.

More Temptations — Lessors point out they'll supply a truck fleet, tailored specifically to your requirements; capable of expanding or shrinking with seasonal changes in your manufacturing volume; eliminate problems of warehousing and maintaining a truck fleet.

Whether a manufacturer has $3000 or $300,000 tied up in his fleet, leasing is a plan that merits consideration.

All Sizes — Big names in the truck leasing boom are Hertz (20,000 trucks directly owned or under license); National Truck Leasing Systems (20,000 trucks operated by 57 member companies in 180 cities); Avis, and Greyhound.

In all, upward of 2500 lessors are supplying trucks for other people to drive. About 2 pct of the nation's nine-million-vehicle truck fleet is for lease. Truck leasing isn't growing as fast as car rental, or even car leasing. But it's booming, nevertheless.

Growth of Hertz—Hertz President Walter L. Jacobs says that a truck lease company can expect a 10 pct a year growth. "In recent years the figure has exceeded that," he points out, "but in the long run, a 10 pct gain is possible." Hertz is a giant in the industry, accounting for one-fifth of total industry volume last year.

Hertz has gone from 5,339 vehicles owned by the parent corporation in 1954, to 12,857 units in 1956. The figure now is well over the 13,000 mark.

Small Firms First — With little cash advantage offered and no direct selling pitch aimed at them, manufacturers still are putting their toes in the water. Quite a number now are beginning to take the plunge.

First companies to fight their way into the front offices to learn what leasing had to offer were smaller firms. Many now are leasing a one- or two-truck fleet full time. Products being shipped range from warehouse steel to air conditioning equipment.

ICC Rates Hit — The cost fight is still going on. What's the cheapest way to truck your goods? A contract cartage company will supply truck drivers, which leasing companies do not. It's significant that many cartage contractors themselves are truck lessees.

Some smaller firms say they believe they can lease one or two trucks and ship goods on intermediate distance hauls for less than common carrier truck rates which, under ICC regulations, are becoming as involved as rail rates.

Leasing is gaining ground. And it's doing it in a market that the lessor isn't even trying to sell. This is one development that bears watching.

What Truck Leasing Has to Offer

▪ As a new service that is just starting to catch on, the truck leasing industry is in an enviable position. Using low-pressure selling tactics, it gets more business than it can handle.

Lessors are too busy supplying trucks to the distribution industry to pay much attention to manufacturers.

But if a manufacturer takes the time and trouble to seek out a truck lessor he will be told the advantages of hauling his goods via leased vehicles:

Capital tied up in truck ownership is freed for more productive uses.

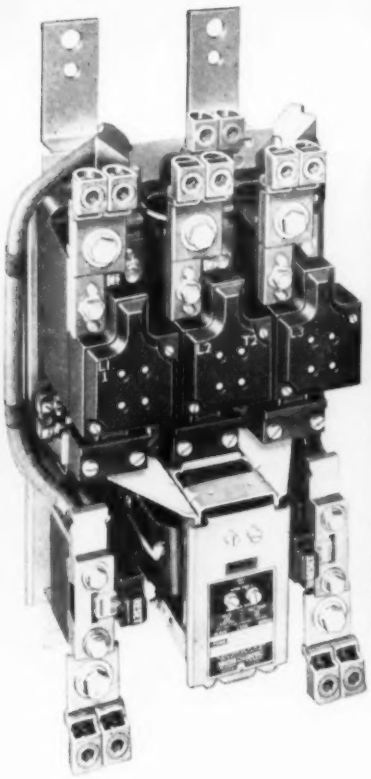
Trucking costs are wrapped up in one deductible package.

Maintenance headaches and the need for hiring your own crew of mechanics are eliminated.

Cost analysis and clerical team required to keep a company-owned truck line in the black is unnecessary.

It's true that a contract cartage company will supply truck drivers —which leasing companies do not. It's significant, however, that many cartage contractors are themselves truck lessees.

NEW



SQUARE D Vertical Action SIZE 5 STARTER

Smaller! REQUIRES ONLY 270 SQUARE INCHES OF SPACE

DESIGN LEADERSHIP FEATURES IN SQUARE D's COMPLETE LINE OF VERTICAL ACTION STARTERS—SIZE 0 through 5

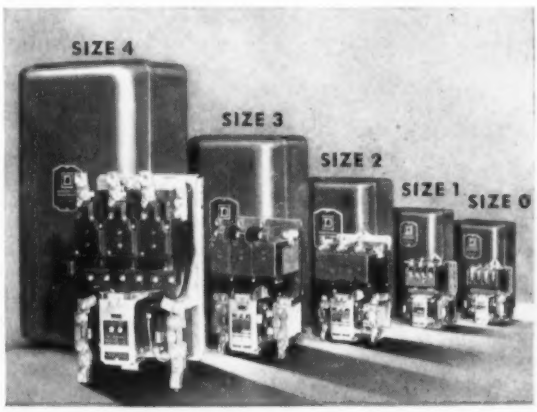
What's most important in a motor starter?

Performance and **long life** come first, naturally—and Square D's straight line guided motion and heavy-duty silver alloy contacts assure both. But that's only the beginning—

Fast wiring is important, too. Square D gives you a lot of wiring space and time-saving solderless terminals.

Easy maintenance rates high. The coils, contacts and overload relays on all Square D starters can be changed in a jiffy... without disturbing external connections. A screwdriver is all you need. And—

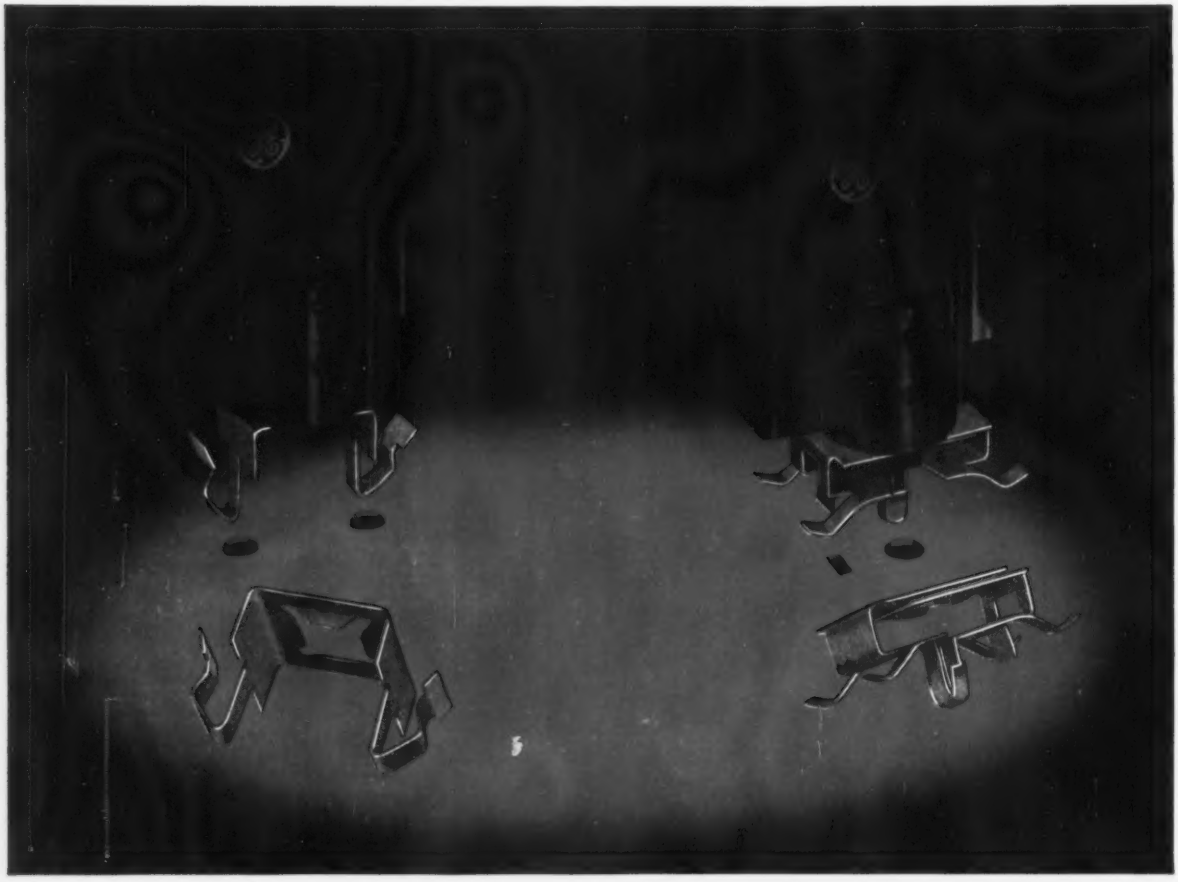
"Off-the-Shelf" Parts Kits make normal maintenance and "on-the-job" modifications easier than ever. Packaged parts include interlocks, contacts, coils, overload relays, pushbuttons and selector switches. They're easy to buy, easy to identify and faster to install.



For the complete story, write for Bulletin 8536 Square D Company, 4041 N. Richards St., Milwaukee, 12, Wis.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY



Engineered by Tinnerman...

On the assembly line...and in the field plug-in **SPEED CLIPS**® simplify rectifier installation

At General Electric, two variations on a single SPEED NUT® principle are being used to make things easier for production-line assemblers and for electronics servicemen.

The basic idea of the Tinnerman front-mounting SPEED CLIP is incorporated into the sockets of GE germanium rectifiers made by GE's Semiconductor Products Department, Syracuse, for industrial electronics applications.

On the TV production line, the Tinnerman SPEED CLIP permits rapid, tight, and simple installation of rectifiers. In the field, merely by unplugging the original equipment rectifier and plugging in its germanium replacement, the serviceman can quickly get a unit back in service.

Working together, General Electric and Tinnerman engineers developed the two types of SPEED NUT parts that are fabricated right into the rectifier shells.

Unusual applications of the SPEED NUT principles to scores of different products are developed every day at Tinnerman. That's why over 9,000 different forms of SPEED NUT Brand Fasteners have been designed for all leading manufacturers.

Your fastener problem can probably be solved quickly by a call to your Tinnerman sales representative. If his name isn't in your telephone directory, write to:

TINNERMAN PRODUCTS, INC.
Dept. 12 • P. O. Box 6688 • Cleveland 1, Ohio

TINNERMAN

Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

Tool Leasing Policies Are Readied

A package set of standard regulations covering government machine tool leasing policies, to go with the uniform leasing rates set this summer, will be put into effect within a week or so.

Top officials of the Office of Defense Mobilization are now reviewing the regulations, and unless a hitch develops, should approve them "very soon," a spokesman says.

The new regulations, which would apply to both defense and non-defense leasing and be followed by all government agencies leasing tools, will cover: Purchase and renewal options, installation, permissible uses of leased government tools by industry, maintenance, repair, transportation, and removal.

Answers Complaint — Industry has complained that previously non-uniform leasing rates, plus the present widely varying policies on matters covered by the new regulations, have given some firms sharp competitive advantages.

The new regulations to be issued soon by ODM will cover all recommendations but one—that the fees be placed in a special fund to finance tool modernization and replacement, which requires congressional action.

New Ore Firm Formed

Oglebay, Norton & Co. of Cleveland, already a substantial mining and contract mine operator, has announced plans to merge with nine firms for which it already serves as sales agent or manager. The new firm, to be known as Oglebay Norton Co., would have total assets of $53 million, earnings of $3.7 million and 3000 employes.

The parent company is one of the early developers of taconite technology and a major mine owner and operator. Companies which would merge on a stock exchange basis include Montreal Mining Co., which has the world's deepest underground iron mine on the Gogebic range at about 4200 ft.; Columbia Transportation Co., which has eight Great Lakes ore boats; Ferro Engineering Co., which produces hot-tops for quality steel ingots; Richwood Sewell Coal Co., a West Virginia mining firm; and North Shore Land Co., which has extensive Minnesota taconite reserves. Others include Saginaw Dock & Terminal Co.; Pringle Barge Line Co., which operates tugs and barges between Toledo and Detroit; Fairport Machine Shop Inc., a Fairport Harbor, O., vessel repair yard; and Standard Box Co. in Cleveland.

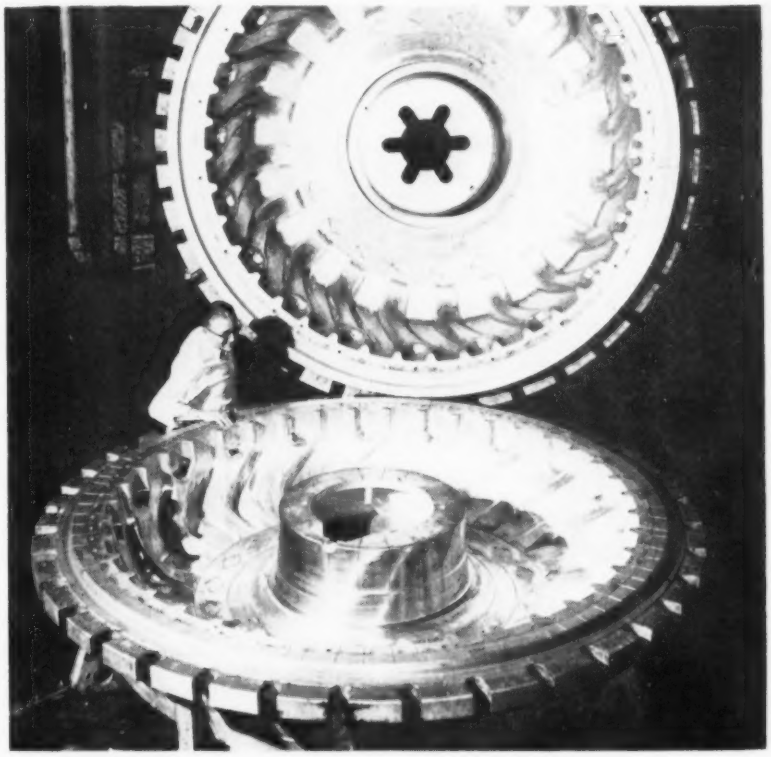
Steelmaking Centers

Within a 35-mile radius in northwestern Ohio are located three geographical centers of the iron and steel industry, the American Iron and Steel Institute reports.

New center of steelmaking capacity is at Westminster, O. The present center of blast furnace capacity is La Rue, O. Shelby, O., is the heart of hot-rolled sheet and strip capacity.

The centers have been moving apart since 1951. The steelmaking center shifted 17 miles southwest from Mt. Cory. Blast furnace area moved 10 miles east from a position in 1951 halfway between Kenton and Mt. Victory, O. Hot-rolled sheet and strip capacity location made the biggest move — shifting more than 40 miles northeast from the former location at Wharton, O.

This gives an idea of geographical shifts in finishing capacity.



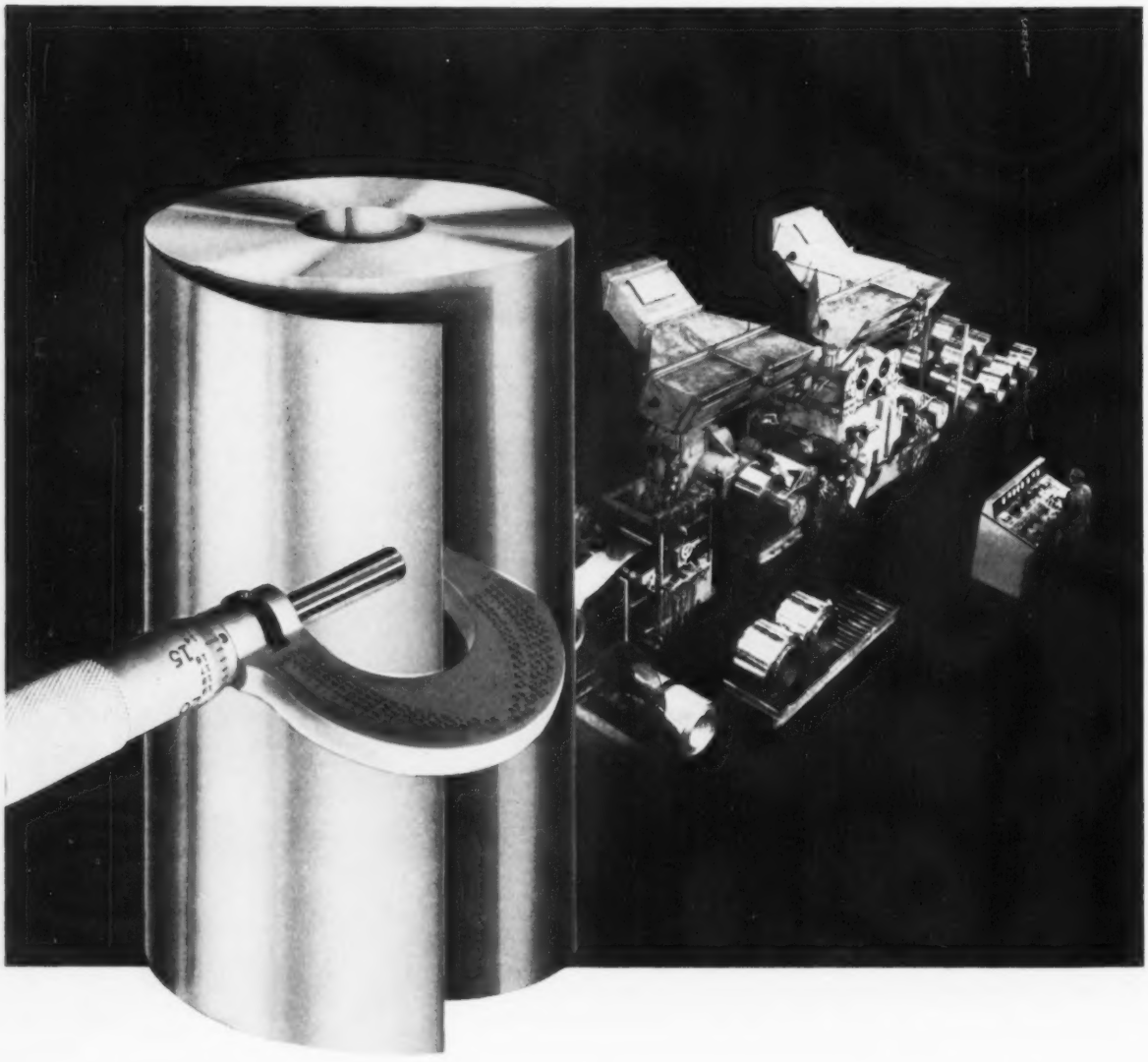
King-Size Molds Made

Aluminum tire mold sections, with a combined weight of almost eight tons, have been sand foundry cast by the Aluminum Co. of America of Cleveland.

Now being installed at a Goodyear Tire & Rubber Co. plant, they will be used in the production of large tires for construction equipment. The switch to aluminum for the large metal castings was made to save shipping, machining, and handling costs. The molds are 8 ft 10 in. in outside diam. Casting section thicknesses range from 3½ to 10 in. Tires produced in them will be almost 7½ ft diam and weigh 2500 lbs.

When Brass Strip Tolerances Call For

PERFECTION TO THE "Nth" DEGREE



Possibly, you've never seen—or even heard of—a Sendzimir Rolling Mill like the one pictured above. Not many people have. But if you use close-tolerance brass, copper or bronze strip, you'll certainly appreciate what these high-speed, precision units can do when you order Bridgeport Sendzimir-Rolled Strip.

These mills—now in operation at Bridgeport's plants—are capable of rolling light-gauge strip into economical, long-length coils to meet the most rigid gauge tolerances.

Bridgeport Sendzimir-Rolled Strip has other advantages as well. It has remarkable uniformity of gauge and mechanical properties from edge to edge and end to end. It also has a beautiful luster—all properties you can use to advantage in your own production.

Get details on Bridgeport Sendzimir-Rolled Strip today. Our nearest Sales Office is ready to give you complete information.

matched
Bridgeport **Brass Alloys**
to your job

BRIDGEPORT BRASS

Offices in Principal Cities • Conveniently Located Warehouses
Bridgeport Brass Company, Bridgeport 2, Connecticut
In Canada: Noranda Copper and Brass Limited, Montreal

Frederic H. Chapin

Beating a Path to More Profits

National Acme's F. H. Chapin has some good advice to offer.

Superior marketing tactics are a boon to business, but you can't rely on them alone.

Sooner or later, you will have to come up with a better mouse trap.

■ One of the popular pastimes at National Acme Co. shipping room in Cleveland is guessing what on earth the automatic chuckers and other machine tools coming from the shop are supposed to make.

And it's no wonder. Behind them is the personality of Frederic H. Chapin, a man with an industrial mission. His mission centers on the need for continual product improvement.

Basis for a Theory—"As soon as you are sure a product can no longer be improved," he says, "you can begin to write its epitaph." Behind this advice is 40 years experience in metalworking. As president and board chairman of National Acme, he has seen his theory work out.

"We are forever crowding more and more tooling into less and less space to get more operations out of machines," he continues. "Sometimes they begin to look like a box of pretzels. But we must continue to get more work out of them in less time if we want to stay with the field."

Saves His Company—It's a common sight to see Mr. Chapin barging into the company's engineering department with a brainstorm, which usually pans out. But while he is respected for his engineering ability, he is equally respected for his financial and administrative capacity.

F. H. CHAPIN: When a product can't be improved, write its epitaph.

When he moved into National Acme's presidency in 1926, the firm was on the verge of bankruptcy. In 15 years the company had not redesigned its main product—an automatic screw machine. After a rough period, National Acme piled up a 20 year uninterrupted dividend record.

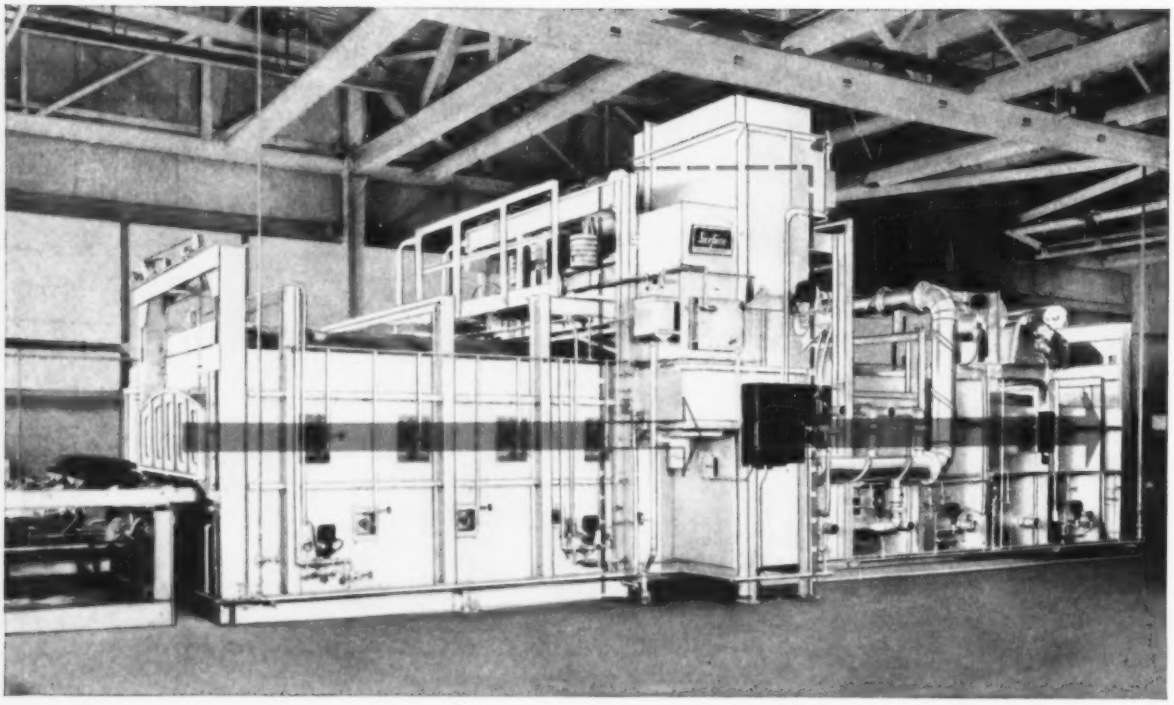
Many Avocations — Largely responsible for this success, Mr. Chapin says, is the constant search for new and better machine designs. The latest, which was three years in the making, is a spindle-stopping feature in which the spindle is precisely positioned for cross drilling of forgings or castings to within .0006 in. accuracy.

A good many of Mr. Chapin's brainstorms originate on his 140-acre farm near Cleveland. In his self-designed French chalet, he relaxes by dabbling in cabinetmaking and art.

Mr. Chapin has donated 361 acres to Ohio for Chapin State Forest and won the Cleveland Bird Club's conservation award.

Independent by Nature—During his college days, Mr. Chapin showed the individualism which characterizes his professional life. As an Iowa farm boy at the University of Minnesota, he insisted on taking only those courses he wanted for fundamental knowledge. For many years afterward, the dean kept in touch and was surprised at how the maverick turned out.

Superfast cooling for cycle annealing



A furnace-within-a-furnace makes this Surface cycle annealer one of the most versatile heat treat units in the country. It anneals, cycle anneals, and normalizes gear forgings of different size, shape, and alloy at the net rate of 864,000 lbs. per month or better.

Such exceptional versatility is achieved by a superfast cooling zone. Really a full convection furnace within a direct-fired furnace, this zone is isolated by refractory doors. It can be used or by-passed, depending on which of many cycles the customer wants. As a result, the customer can heat treat as many as 13 different alloys in this one furnace.

Adding to the flexibility of the furnace is a modular tray design. Each module is an 18x20-inch chrome alloy casting. Modules can be combined to hold any size of work up to 800 pounds. They are also used to carry work outside the furnace.

This furnace-within-a-furnace is another proof that Surface engineers are old hands at creating new ideas in heat treating.

Write for Bulletin SC-146 on cycle annealing.

Surface Combustion Corporation, 2373 Dorr St., Toledo 1, Ohio. In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario.

wherever heat is used in industry

Surface®

Buyers Lean to Non-Durables

It may be a situation that metalworking will have to live with for a while.

You can blame it on population trends, but the fact remains that consumer buying gains are concentrated in non-durables and services.

▪ The increase in consumer spending at a pace to match increase in personal income (Washington, P. 75) is encouraging news to most businessmen.

Not so encouraging to metalworking is the fact that the increase in overall spending has not been to the benefit of consumer durables. Instead, the increase in the high rate of consumer spending is almost entirely in non-durable goods and for services.

When Markets Are Spotty—This is not a new phenomenon. It has been going on since mid-1955. Since that time, the overall business boom has continued. But it has been without the accompanying push of the auto industry, the appliance industry, or the farm equipment group to name some.

By and large, with the exception of farm equipment, these industries have done well. But some of the manufacturers have gone to the wall or faced merger or acquisition. Many of their dealers have folded. Unemployment and layoffs have been unpleasant news.

Cutback or Not—Some of their suppliers of basic materials or parts have faced tough going, particularly where they do not have parallel outlets with the segments of industry that are booming.

It's not a well-kept secret that many executives now wish they held some of the money that they have put into or have committed to expansion and modernization programs. This is reflected in the reports that capital expenditures are not coming up to original estimates, although still at a record level.

A recent, although slight upturn in manufacturing of durable goods may be attributed to replenishing of dealer inventories.

Live With It—It's possible that this is a situation that the durable goods makers may have to live with for a while. But only for a while. And remember this is not necessarily a bad situation.

While these markets may not have expanded at an even rate every year, rate of durable goods spending is still at a very creditable high.

Birth Rate Economists — The birth rate economists may have something here. The increase in the number of two-car families, for example, may not be enough to compensate for the depression-created sag in the 25-35 year-old group of our population.

The appliance industry has done a terrific job in creating obsolescence in its models of stoves and refrigerators. But this is not enough to take up the slack in new home building, which also can point to the population factor as well as tight money.

Can't Stand Still—But this is not an encouragement to be over-cautious, to retrench or to maintain the status quo. There is no change in the long-range growth of the economy and the 1960's are coming up faster than you may think.

Business Looks for Financing

Creating the Pinch—One of the reasons why money stays tight is reflected in an Office of Business Economics study of business financing in 1957.

It points out that business firms have increased their use of outside sources of capital. At the same time, they have decreased use of internal funds, such as retained profits and depreciation or liquidation of cash.

No Inventory Buildup—A comparison of first half 1957 with 1956 shows that businesses increased their financing from external sources from $8 billion to $8.5 billion. At the same time, internal sources declined from the $20.5 billion figure for first half, 1956, to $18 billion this year.

Use of funds also supplies some significant facts. The total actually declined in comparing the two periods, but this was due to a drop of $5 billion to $2 billion for outlays to increase inventories.

Capital Needs — Use of funds to expand fixed capital increased from $13.5 billion to $15.5 billion, comparing the first half 1956 with the like period this year.

Referring to the inventory picture, the $5 billion of the first six months of last year reflects the inventory buildup characteristic of the period. The $2 billion figure is in line with seasonal needs.

A Look at the '58 Chrysler Line

Tail Fins Get Under-the-Hood Support

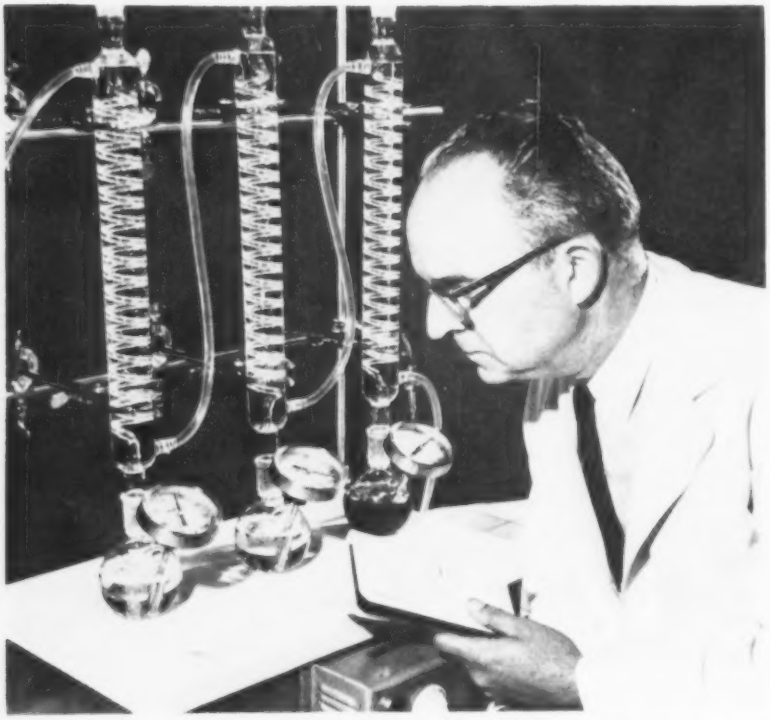
Styling changes in next year's Chrysler-built cars will be relatively minor.

Not so with mechanical innovations. The list begins with a new engine.—By H. R. Neal.

■ Chrysler Corp.'s cars for 1958 will stick with the high-flying fins that lifted the company off the ground in 1957 and sent sales soaring. To keep the firm air borne some major engineering and mechanical innovations will be introduced on the new models.

Major advancements are found in two entirely new 350 and 360 cu. in. displacement engines. Designed primarily for the firm's De Soto lines, the engines will also be available to Dodge and Plymouth buyers.

Weighs Less—Features of the new engines include tapered combustion chambers, single rocker shafts, and in-line overhead valves with hydraulic lifters. Deep-skirt blocks add rigidity to the entire power plant. This also contributes to smoother and quieter operation by supporting more of the torque converter housing or clutch housing.



BETTER STOPPING POWER: Sample of a new, extra-stable brake fluid developed by Chrysler for its 1958 cars, is run through a boiling test by John Wright, Chrysler project engineer. Fluid resists heat and cold.

Weight of the new engines is reduced by as much as 70 lbs under that of power plants of similar displacement. Paul C. Ackerman, Chrysler Corp. vice president and director of engineering explained this gives these engines the highest torque ratings per lb of engine weight ever offered by the company. While auto makers can't talk about it, horsepower and performance characteristics of Chrysler's other V-8's has been increased too.

Gas-Saving Choke—Mr. Ackerman termed a new automatic choke on all V-8 engines as "a significant development, contributing greatly to improved fuel economy."

"The Econo-Choke, together with newly-designed and recalibrated carburetors, closely regulates fuel-air mixture during warm-up periods and noticeably reduces gasoline consumption," he said. Mr. Ackerman said that in precise engineering tests, the new choke-carburetor combination recorded up to three more miles per gallon in typical housewife-to-the-grocery trips of less than five miles.

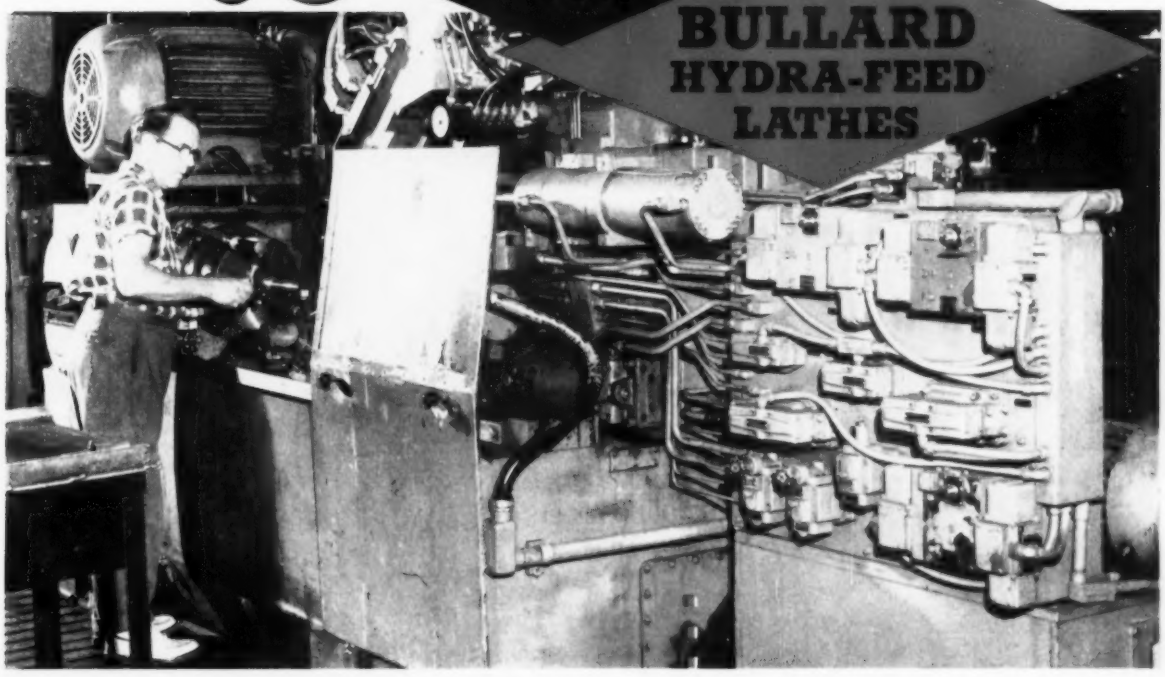
The new choke has a triple-stage vacuum piston designed to match choke position more accurately to engine needs during warm-up. This prevents overly-rich mixtures during part-throttle operation, he explained.

Fuel Injection Optional—Fuel injection will make an appearance on the 1958 "performance" cars of Plymouth, Dodge, De Soto and Chrysler. Limited production of the extra-cost system is planned. Along with "super-fast" warm-up,

saves **75%** on changeover time with . . .

simplified set-up

on BULLARD HYDRA-FEED LATHES



Illustrated below is one of more than forty different pieces processed on the same Bullard Hydra-Feed Lathes.

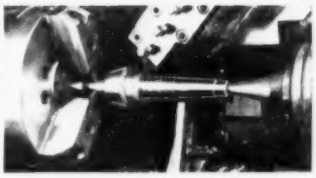
"Unless the consecutive set-ups from one job to another were similar," reports the Foreman of a large midwestern automotive parts manufacturer, "changeover set-ups took from ten to sixteen hours. But now, with Bullard Hydra-Feed Lathes, and going from one extreme to the other, **the changeover is accomplished in less than four hours.**"

Additional reasons for their enthusiastic acceptance of Bullard Hydra-Feed Lathes include less spoilage, greater accuracy, better finishes and reduced machining time over previous method.

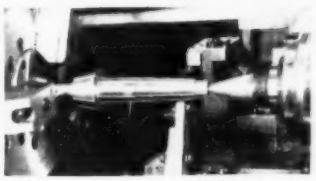
These advantages can be applied to your machining requirements. Call your nearest Bullard Sales Office for full particulars or write

FIRST CHUCKING

SECOND CHUCKING



FINISHED PIECE



THE BULLARD COMPANY
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Remember—to cut costs when cutting metal—buy **BULLARD**

Is your present quenching oil providing the uniform hardness you require? Rejects running too high? Gulf Petro-engineering Service can save you money here!

Put a trained petroleum man on your staff...get GULF PETRO-ENGINEERING SERVICE

You don't have to be a Gulf customer to make use of Gulf Petro-engineering Service. If you have any problem involving petroleum products, or just want to be sure you're keeping pace with new developments in this highly technical field, consult your Gulf Sales Engineer.

His suggestions quite often lead to better equipment performance, greater production, worth-while savings in maintenance costs. He can give you a great deal of assistance, because he's backed by more than 1,300 Gulf scientists, chemists, metallurgists, engineers. You can benefit from their wide experience—through Gulf Petro-engineering Service.

What kind of help can you expect? Well, for example, practical help in the proper selection, storage and use of fuel oils, lubricating oils, cutting oils, rust preventives, greases, solvents, waxes, and process oils . . . complete information on new developments in petroleum science . . . effective aid on many problems.

Gulf Petro-engineering Service is available to you through 99 Gulf District Sales Offices and 8 Division Sales Offices. Consult your local telephone directory for the nearest Gulf office. Or write us for new 24-page booklet covering this new and important service to American industry.

GULF OIL CORPORATION
1822 Gulf Building
Pittsburgh 30, Pa.

GULF

Automotive Production

WEEK ENDING		CARS	TRUCKS
Sept. 28	1957*	52,225	8,821
Sept. 21,	1957	52,365	13,441
Sept. 29	1956	42,369	13,316
Sept. 22	1956	35,652	14,170
TO DATE	1957	4,671,400	813,300
TO DATE	1956	4,229,011	836,113

*Preliminary Source: Ward's Reports

increased fuel economy is claimed for the device.

The Chrysler fuel injection differs from others in its fundamental concept. Gasoline is portioned out by means of electrical pulses rather than a mechanical metering device. Heart of the system is a "brain," about the size of a three by five-in. card box, which houses a transistor equipped electronic modulator.

Safer Steering — A completely new full-time power steering unit has been designed for 1958. Only half as long as the 1957 unit, it is simpler in design and is located entirely under the hood. An "on-center" feel has been designed into the new unit, providing a greater sense of security to the driver.

A limited-slip differential will also be offered as optional equipment. When one rear wheel is stuck in mud, ice or snow, power is automatically transferred to the wheel with the best traction. It will be available on all new Chrysler-built cars.

Controlled Speed—"Auto-Pilot," a new speed control device automatically holds a car at a pre-set cruising speed. A touch of the toe on the brake pedal releases the Auto-Pilot instantly. Its speed setting may be over-ridden by extra pressure on the accelerator.

Dual headlamp systems have been extended to all lines and will be standard equipment.

Several highly practical accessory items will be made available on the 1958 line of cars. One such item is a rear window defroster that keeps the inside glass free of condensed moisture. A four-stream windshield washer doubles the cleaning power of previous models. It is standard on Imperial models and on the Chrysler New Yorker and Saratoga, but optional on all other Chrysler-built cars.

New Models Coming—Imperial will offer electric door locks for the first time. These make it possible to lock or unlock all doors in a car from a single control located on the instrument panel.

Several new lines will make their appearance in Chrysler Corp.'s 1958 line-up. Chrysler division is bringing out a new Chrysler Windsor series for 1958 on a smaller 122 in. wheelbase. The 1957 Windson series shared the larger 126 in. wheelbase with the New Yorker and Saratoga.

Same but Different—Mention of styling changes have purposely been held for the last. Grille and tail light treatments have been redesigned for all lines, but retain identity characteristics with their 1957 counterparts. Color-sweeps and side trim has been restyled to distinguish the 1958 models, but Chrysler's "three-years ahead" styling won't be out-moded by its competition.

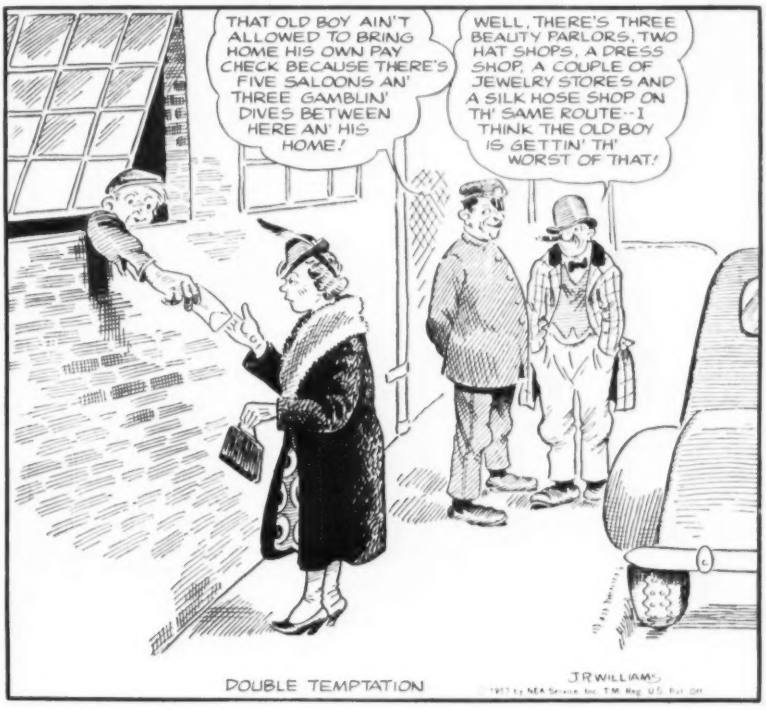
AMC Offers Plan To Reuther

George Romney, president of American Motors Corp., was overlooked by UAW labor leader Walter P. Reuther in his challenge to Big Three auto makers to cut the price of their 1958 models. But Mr. Romney is an astute gentleman who is not to be overlooked, even by Mr. Reuther, in his pre-season jousting with General Motors, Ford and Chrysler.

Now Mr. Romney has come forth with a straightforward proposal that digs at the root of the problem. His proposal: "Help cut costs and AMC will give a $100 rebate on its 1958 automobiles."

The proposed rebate, Mr. Romney said, would be brought about by reduced labor costs. This could be achieved by a reduction in pay or an increase in productivity, or by a combination of the two. AMC still has higher labor costs in some areas because of "pattern plus" settlements prior to 1955. In that year the firm settled for less than the pattern.

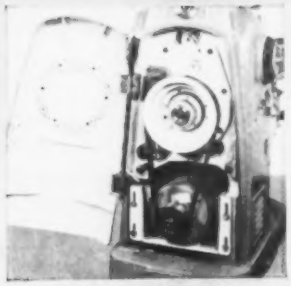
THE BULL OF THE WOODS By J. R. Williams


THAT OLD BOY AIN'T ALLOWED TO BRING HOME HIS OWN PAY CHECK BECAUSE THERE'S FIVE SALOONS AN' THREE GAMBLIN' DIVES BETWEEN HERE AN' HIS HOME!
WELL, THERE'S THREE BEAUTY PARLORS, TWO HAT SHOPS, A DRESS SHOP, A COUPLE OF JEWELRY STORES AND A SILK HOSE SHOP ON TH' SAME ROUTE--I THINK THE OLD BOY IS GETTIN' TH' WORST OF THAT!
DOUBLE TEMPTATION
J.R.WILLIAMS

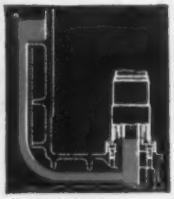
Inside Story of a Smart Buy for Your Shop . . .

It's a good idea to look "under the hood" when buying machine tools. Hidden features may give you some real clues to the machine's potential for your particular objectives. A quick look "under the hood" of CINCINNATI® ML and MI Milling Machines reveals a host of features that work unseen toward the common goal of every shop . . . to reduce the cost of production. Five features are illustrated below. Of course, there are many more. Would you like to have additional information? For brief data look in Sweet's Machine Tool File. Or for complete specifications, write for a copy of catalog No. M-1916-2.

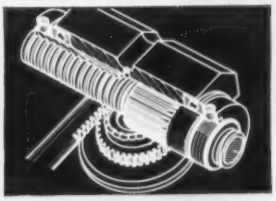
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO



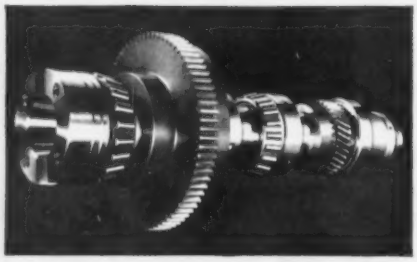
Cradle type mounting for spindle drive motor greatly simplifies removal and servicing of the motor.



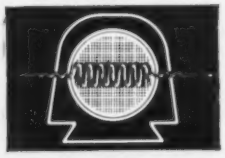
Vertical screw is submerged in a bath of oil from its own reservoir, assuring long, accurate life.



Automatic backlash device increases productivity. Machine can mill equally well as the table feeds to the right, left or alternately right and left.



Anti-friction mounting with center support for the heavy spindle assembly, smoothly transmits maximum cutting power.



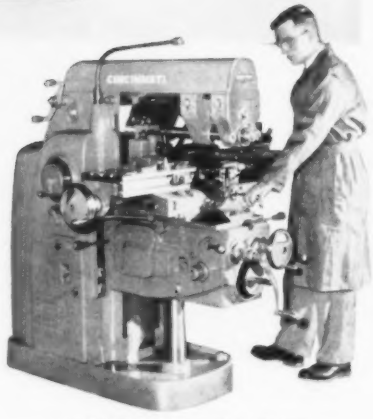
Dynapoise overarm smooths out the cutting action; provides straight-edge alignment for arbor supports.

Brief Specs CINCINNATI ML and MI Milling Machines

Size	No. 2ML		No. 2MI			No. 3MI	
Style	Plain	Univ.	Plain	Univ.	Vert.	Plain	Univ.
Longitudinal Range	28"	28"	28"	28"	28"	34"	34"
Sixteen Spindle Speeds	25-1500 rpm all sizes and styles (higher and lower ranges optional)						
Sixteen Feeds	¼-30" per min., all sizes and styles						
Motor Drive: Spindle	3 hp	3 hp	5 hp	5 hp	5 hp	7½ hp	7½ hp

CINCINNATI

MILLING MACHINES • BROACHING MACHINES • CUTTER AND TOOL GRINDERS • SPECIAL MACHINE TOOLS • METAL FORMING MACHINES HARDENING MACHINES • CUTTING FLUID • GRINDING WHEELS



CINCINNATI No. 2 MI MILLING MACHINE
Catalog No. M-1995

Buying Spree Cheers Business

And It's an Unexpected Surprise to Most

A sudden spurt in retail sales and home building is putting new life into many businesses.

The "experts" were caught off base again by the early surge. It wasn't expected until later, if then.—By G. H. Baker.

▪ Unexpected buying strength in two key areas—retail sales and home building—is nudging the overall business picture out of its early-fall lethargy.

These welcome signs of above-average spending come as something as a surprise to the Eisenhower Administration financial experts, for they hadn't actually counted on anything spectacular in retail circles until just before Christmas. And home construction, too, was probably already in its seasonal winter slump, they believed.

The Good News—But there's no accounting for the reasons consumers have for buying what they buy—or when they buy it. To the delight of most of the nation's merchants and dealers, retail sales are unaccountably s p r i n t i n g along about 5 pct ahead of six months ago and about 7 pct ahead of a year ago.

And the gain isn't all due to inflated prices, as examination of consumer spending shows. The volume of merchandise being sold is larger.

Inventories Low, Too—Another cheerful note for manufacturers: Because many jobbers and retailers worked their inventories down during the summer months, the brisk pace of new sales is necessarily causing factories to turn out more goods. Manufacturers now have to step up their output to keep pace with new orders.

There's evidence also that farmers are doing better, moneywise. Total farm income is running at an annual rate of about $12.6 billion, which is $500 million more than the rate this time a year ago.

Last Quarter Rally—What these points add up to is this: The U. S. economy may yet finish this year on a strong note. Last year, new investment in plant and equipment picked up late in the year to push the total up to a new high. And in 1955 it was an end-of-the-year surge of consumer buying that sent final figures spinning up to a then-record. If the present trend in home building and consumer buying holds up, this year's total business activity may well end up at or near the record totals chalked up in 1955 and 1956.

Personal income also continues to establish monthly records. For July and August it averaged 6 pct higher in dollars and about 2 pct more in purchasing power than in the same period of 1956.

Higher wage and salary levels are responsible for most of the gain.

Plenty to Talk About

HEADS TOGETHER: Outgoing Sec. of Defense Charles Wilson and his successor Neil H. McElroy have a lot to talk over before the Defense Dept. changes hands about Oct. 10. Spending cuts are most prominent item.

More Far Eastern Trade Coming

Coast's Pace Above the National Level

Pacific Basin nations and West Coast ports are developing closer trade ties.

Business volume in '56 was $3 billion, an increase of 20 pct over rate in the previous year. —By R. R. Kay.

■ Look for a big hike in foreign trade between the West Coast and Japan, the Philippines, and Hong Kong. Farwesterners are hot and heavy after this business. And the Oriental people have their welcome mats spread wide.

The Coast's foreign trade is spurting ahead of the national pace. The next few years should see it climb still higher. There will be closer trade ties between Pacific Basin nations and the West Coast.

The region now does 10 pct of the total U. S. foreign commerce. That's an all-time high. Last year the value of West Coast foreign trade was $3 billion—up more than 20 pct from the previous year.

Hunters From the East—What's pushing this area into the world trade spotlight?

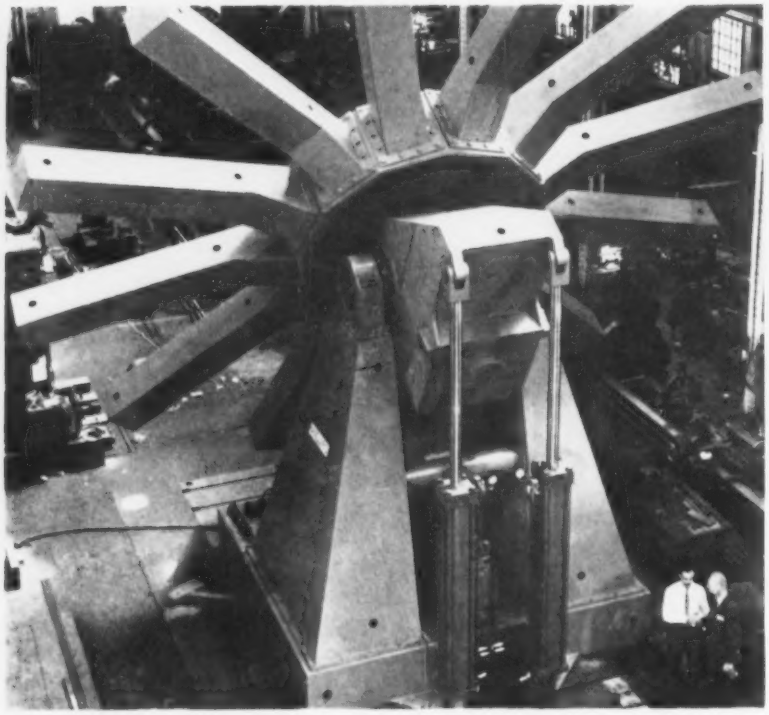
(1) Increasing industry in foreign lands puts manufacturers on the hunt for new tools, materials, and services. They find lots of good ideas and equipment readily available in America's Farwest.

(2) Aggressive new-business-seeking by West Coast trade groups and chambers of commerce is paying off. They're making lots of new friends in foreign countries. And they're influencing business with the farwestern states.

(3) Modern West Coast harbor facilities play a big part. They can and do move a large variety of products swiftly. Oregon and Washington ports are sharing in a bigger percentage of the business. Oregon's export-import value went up 35 pct last year; Washington's rose 25 pct. Expansions are in the works at the major California ports: Los Angeles, Long Beach, San Francisco-Oakland, and San Diego.

Another big boost in trade volume comes from the Federal government's surplus disposal programs.

Introducing Welding's Big Wheel



POSITIONER READIED: Designed by Pandjiris Weldment Co. for the Mare Island Naval Shipyard this 100-ton welding positioner gets final test at building site in Bethlehem Pacific's San Francisco shipyard.

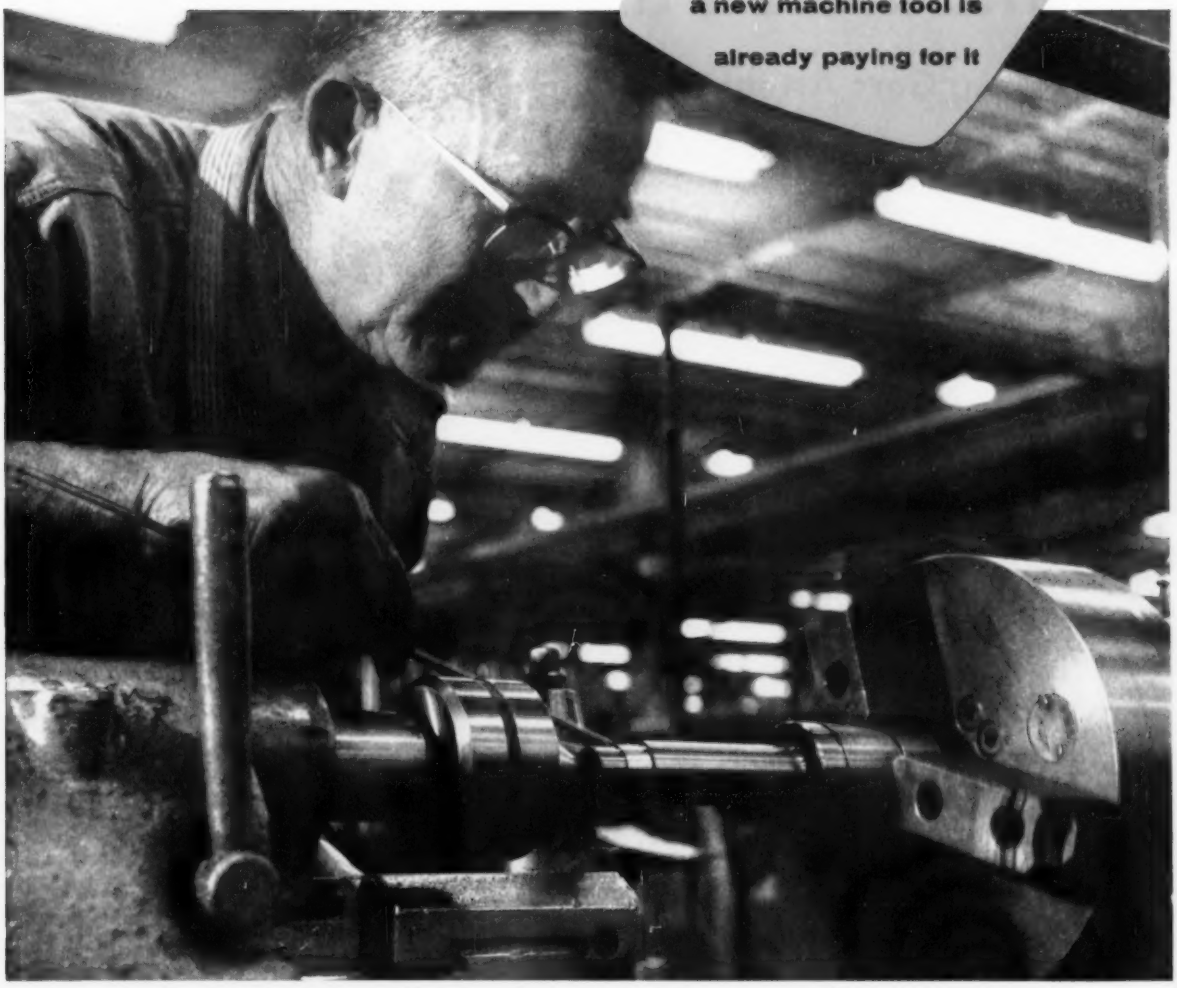
Water Lures Industry

What's the most important single factor in selection of a new industrial site? That's a question that can get an argument going almost any time.

A top man in the Army Engineers believes that water supply will soon be the key. Maj. Gen. Walter K. Wilson, Jr., deputy chief for Engineers' construction, believes that the Pacific Northwest, with its abundant water supply, will be in a fine position to attract water-hungry industry.

JONES & LAMSON
MACHINE COMPANY

the man who needs
a new machine tool is
already paying for it



Still useful, yes . . . but is it still Profitable?

When the purchase of new machine tools comes up for discussion, it's not at all unusual for someone to comment — "but our present machines still seem to be doing a good job".

On the surface, this objection seems to make good sense. It doesn't stand up, however, because it isn't good economics.

While surveying a number of metalworking plants recently, a prominent industrial publisher discovered this startling fact: — *In every plant with machinery more than ten years old, profit margins were steadily falling!*

Why should this be the case, especially when sales were at an all-time high?

The answer, of course, is that older, still "useful" machines cannot produce enough goods at a low enough cost to compete favorably with new machines on a profit basis.

Write for J & L's Replacement Information Kit, which contains much valuable information. Jones & Lamson Machine Company, 511 Clinton St., Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Threading Dies, Taps & Chasers

Distributors Push Sales Drive

Market Sag Gets Attention From AMTDA

Both builders and distributors at group's annual meeting faced up to the recent decline in tool sales and shipments.

Attention was given ideas and information which might spur buying.—By E. J. Egan, Jr.

■ The long-term sales outlook for U. S. machine tool builders is bright. But it's this month's business that pays next month's rent, and the current picture doesn't have builders—or their distributors—jumping for joy.

This was apparent at the 33rd annual meeting of the American Machine Tool Distributors' Assn. in Cleveland last week. A record number of distributors turned out. So did a large guest delegation of builders. Together they took a serious look at the present state of business.

Sales Almost Halved—The facts they faced up to were simply these: (1) Overall sales of metal cutting machines started sliding about a year ago, have gone from $87.5 million in August, 1956 to $44.7 million last month; (2) shipments, which ranged between $77 and $89 million monthly in the first half of 1957, dipped to $58.7 million in July and rose slightly to $63.5 million in August.

One thing was quite clear at this meeting: It was definitely not a crepe-hanging session. On the contrary, distributors and their builder principals settled down to formal and informal sessions with an intent, positive attitude. There was no time allotted for post-mortems.

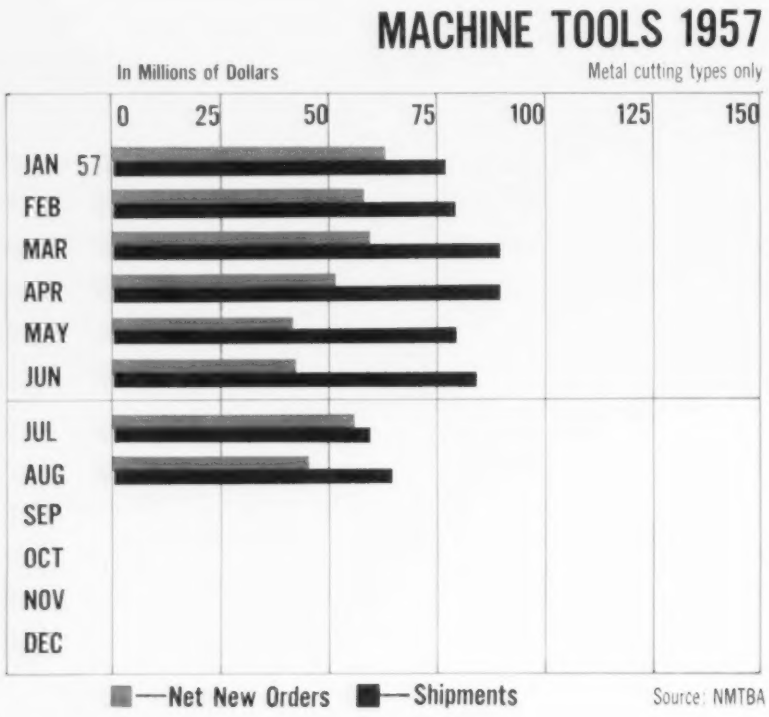
Open for Suggestions — The president of a midwest distributing firm put it this way: "If people aren't buying machine tools, it's our fault, not theirs. We know that new equipment can save them money, but we're not proving that point often enough.

"I'm here to learn anything I can about improving my sales effort," he explained. "I've got the best equipment built anywhere in the world, and I'll listen 24 hours a day to any suggestions for selling more of it."

Time will tell whether the information and ideas relayed by guest speakers and panelists will put machine tool sales back into high gear. Builders have their fingers crossed. Compared to 1955, 30.4 pct of them are presently using more distributor outlets. Only 17.5 pct are using fewer distributors than they did two years ago.

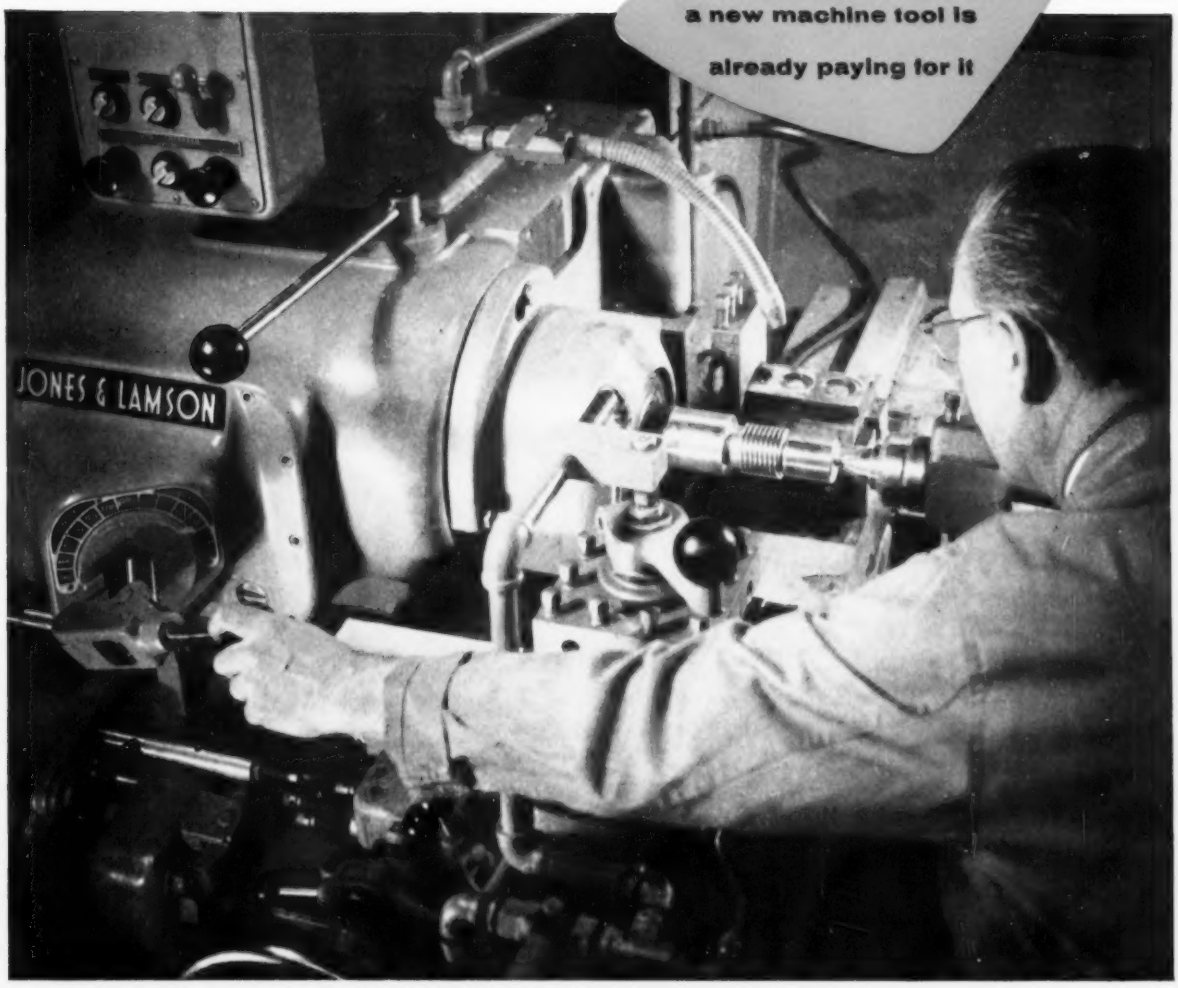
Newly elected AMTDA officers for 1958 are: President, Frank H. Habicht, Marshall & Huschart Machinery Co., Chicago; first vice president, J. O. Ellison, Harron, Rickard & McCone Co. of Northern Calif., San Francisco; second vice president, J. Russell Clark, White Star Machinery Co., Wichita; secretary – treasurer, George E. Merryweather, Motch & Merryweather Machinery Co., Cleveland.

The Assn.'s 34th Spring Meeting will move south. A two-day session is already being planned for March 10 and 11, 1958, at the Hotel Roosevelt in New Orleans.



JONES & LAMSON MACHINE TOOLS

the man who needs a new machine tool is already paying for it



The Turret Lathe with a fully automatic thread-chasing cycle!

Here is full turret lathe versatility and a threading attachment with a fully automatic cycle — all in one machine. Now you can be sure of concentricity of threading with other lathe work, *all done in one chucking*, with the time saving of the Auto-Threader!

This Auto-Threader will chase straight or taper threads — or a combination — internal or external, from the front of the machine.

Other features include: uniform thread length, by means of positive stop and follower nut disengagement together with rapid tool withdrawal; precision lead control by full depth follower nut engagement on a hardened and ground leader.

Write for descriptive folder No. 5440. Jones & Lamson Machine Company, 511 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Threading Dies, Taps & Chasers

INDUSTRIAL BRIEFS

Ike Names a Miner—Royce A. Hardy, Jr., general manager of Manganese, Inc., Henderson, Nev., is the new Assistant Secretary of the Interior for Mineral Resources. His appointment by President Eisenhower is subject to Senate confirmation.

Longer, Wider Plates—Production improvements at A. M. Byers Co., Pittsburgh, allows rolling of Amballoy specialty steel plate in increased lengths and widths, the company announces. Stainless, alloy, and carbon steel universal plate is now available in widths of from 12 to 36 in. On sheared plate, stainless is available in widths of from 48 to 60 in. Available lengths of alloy plate have been increased by 40 pct and carbon steel plates by 100 pct.

Growth Indicator—The Barden Corp., precision ball bearing producer, has begun construction of a $2 million instrument precision ball bearing plant in Danbury, Conn. Architects are Sherwood, Mills and Smith, Stamford, Conn. Builder is The Austin Co., Cleveland, O.

Bits for the West—Firth Sterling, Inc. is building its fourth strategically located tungsten carbide sintering facility in the U. S. at Los Angeles. It will be the first such plant built on the West Coast by a carbide producer. Production is scheduled to begin Dec. 1, 1957.

A "First" For Foil—The nation's first fundamental research facility to serve the rapidly-growing foil and packaging industries is planned by Aluminum Company of America, at New Kensington, Pa. It will be known as the Foil and Packaging Div. of Alcoa Research Laboratories.

Southern Transfer—A $6 million research and office building will be built by Reynolds Metals Co. in Richmond, Va., adjacent to a $10 million executive office building now being completed. The aluminum firm's general sales offices will be moved to Richmond from Louisville, Ky.

Over the Rainbow—A $5 million contract for production of over-the-horizon scatter communications equipment was awarded General Electric Co.'s Technical Products Dept. by the Air Force. It will be part of a new UHF system used to bounce telephone and teletype signals off the troposphere and over the horizon to distances of 600 miles in one hop. It is expected to be used as the main line of communications at advanced Arctic bases.

Spreading Knowledge — Establishment of 268 four-year scholarships at 48 colleges and universities was announced by Morse G. Dial, president of Union Carbide Corp. This brings the total of Union Carbide undergraduate scholarships to 660 at 95 liberal arts and engineering colleges and universities.

In Science's Interest—Allegheny Ludlum Steel Corp. has granted $5000 to Rensselaer Polytechnic Institute toward the salary of a professor to lead study and research in the general area of melting and solidification of metals. Dr. Wylie J. Childs of Lafayette College has been appointed visiting professor in charge of the project.

Wheels for Canada—Plans for building a second Canadian plant for making EQS cast steel wheels for railroad freight cars were announced by American Steel Foundries, Chicago. The new plant, to be built in Transcona, Manitoba, will be operated by Griffin Steel Foundries Ltd.

Power in Flight—Solar Aircraft Co. received a $4.5 million contract for gas turbine-powered airborne generator sets and spares from the Air Force. The sets will be installed in the Boeing KC-97 Stratotanker. They are designed to function as an independent power source for the planes when they are not flying and as an auxiliary electric power source in flight.

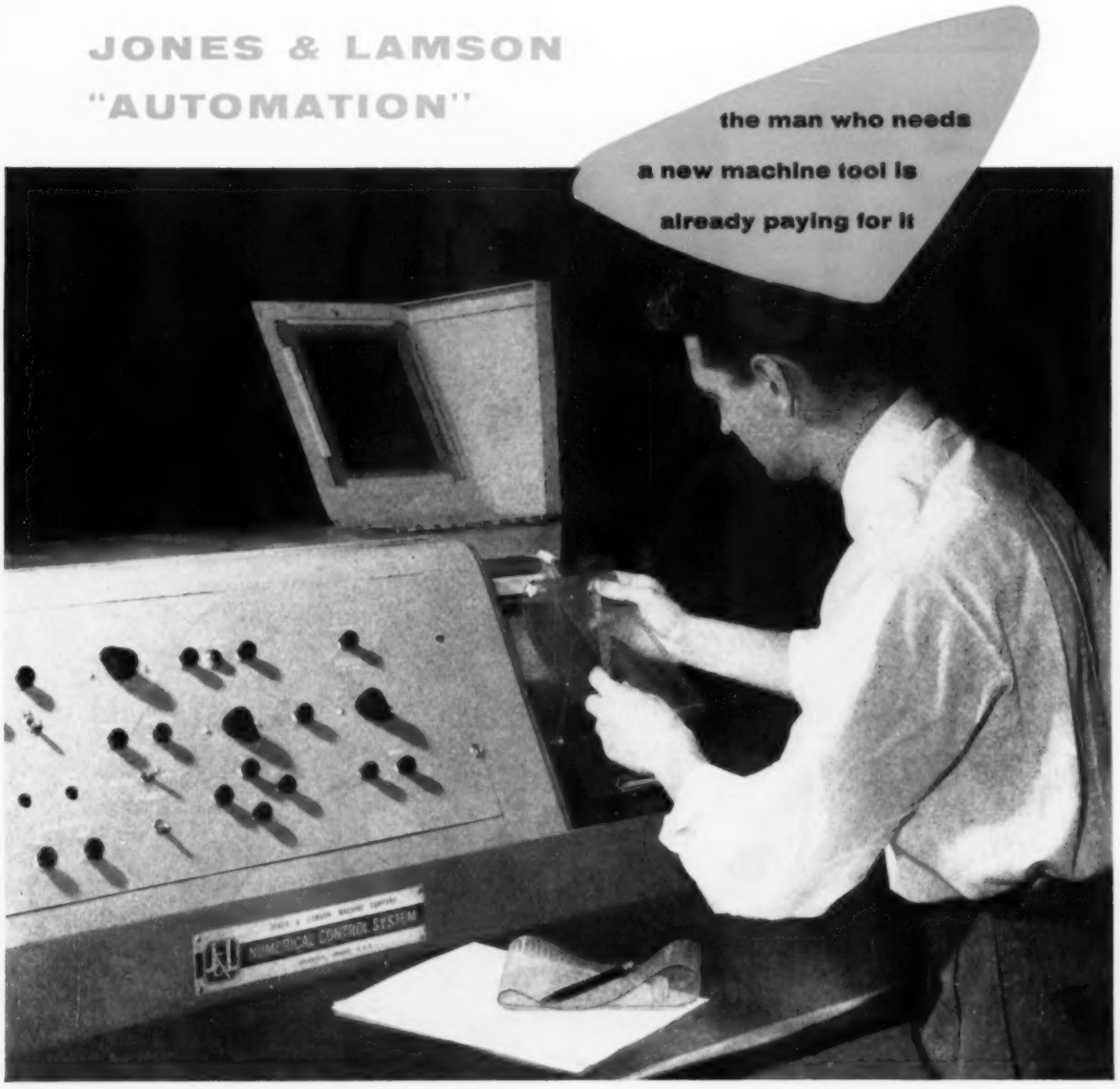
Missile Trigger — The W. L. Maxson Corp. has a contract of about $2 million for the production of missile components from the U. S. Army, Ordnance Corps. The items are part of the arming and detonating system in the Nike-Hercules Missile. It will be produced at the company's Old Forge, Pa., plant.

Two-Way Stretch—Kaiser Aluminum & Chemical Corp. has placed an order with Hydraulik G. M. B. H., Duisburg, Germany, for construction of a 30-million lb plate stretcher to be installed in the company's Ravenswood, W. Va., rolling mill. The machine will be capable of gripping the ends of a 60-ft plate of aluminum alloy and lengthening it as much as 5 ft.

Plain and Fancy—Bohn Aluminum & Brass Corp. has completed a new manufacturing facility at the company's Holland, Mich. plant to make extruded decorative trim. The equipment includes facilities for plain and color anodizing, decorative painting, silk screening, buffing, etching, chemical brightening.

ELECTED: Robert E. Fleming has been elected executive vice president of the Industrial Heating Equipment Assn., succeeding Carl L. Ipsen, who retired Sept. 30.

JONES & LAMSON
"AUTOMATION"



J&L's Unique Approach to "Automation"

"Automation" is a tricky word — one that has many definitions. However, at Jones & Lamson its basic meaning is always the same . . . "the solution to a cost reduction problem".

In some cases, this could involve automatic in-process gaging, size adjustment feed back, self-resetting of tools, and automatic handling for long runs on single machines. Other problems might call for an articulated, sequential *line* of machines, complete with automatic handling, inter-machine transfer and automatic control of speeds, feeds, etc.

Through numerical control, using punched tapes, J&L "automation" *also greatly increases small-lot flexibility*. In this case, machine set-up and change-over become primarily an office procedure.

We would be pleased to show you how J&L's approach to "Automation" can be put to good use in *your* operations. Write for literature — Jones & Lamson Machine Company, 511 Clinton St., Springfield, Vermont.

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MEN IN METALWORKING

F. T. Hughes, elected vice president, Merchandising Div., Pittsburgh Plate Glass Co., Pittsburgh.

C. W. Barrett, appointed manager, Southern District, Republic Steel Corp., Cleveland. He succeeds **E. I. Evans,** who is retiring. **H. H. Northrup,** named district manager, Buffalo; **E. W. Carlson,** named assistant district manager, Buffalo.

R. S. Gruver, appointed administrative vice president, personal and public relations, Armco Steel Corp., Middletown, O. He succeeds **C. H. Murray,** who is retiring.

J. H. Wyres, named sales manager, W-S Fittings Div., H. K. Porter Company, Inc., Roselle, N. J.

C. G. Davies, appointed vice president-operations, Armco Div., Armco Steel Corp., Middletown, O.

E. T. Asplundh, elected board chairman, Pittsburgh Plate Glass Co., Pittsburgh. He succeeds **H. B. Higgins,** who is retiring.

N. M. Sted, appointed Central Area manager of sales, American Steel & Wire Div., U. S. Steel Corp.; **Bruce D. Bennett,** appointed manager-construction material product sales.

L. F. Weitzenkorn, appointed assistant to the works manager, Baltimore Works, Armco Steel Corp.; **J. S. White,** appointed works metallurgist.

D. C. Haney, named assistant superintendent, power and fuel dept., Campbell Works, Youngstown Sheet and Tube Co., Youngstown, O.

G. F. Palmer, appointed assistant general sales manager, Kaiser Aluminum & Chemical Sales, Inc., Chicago; **M. C. Crockett,** appointed manager, industry sales; **S. P. Whiteside,** appointed assistant to the general sales manager.

Bert Cross, named service engineer for Carboloy cemented carbides, Atlantic District, General Electric Co., Detroit.

A. P. Goohs, appointed plant manager, The Thew Shovel Co., Lorain, O.

G. P. Leckler, appointed manager, Chicago branch office and warehouse, The Fairbanks Co., New York.

P. F. Bauer, named managing director, Allis-Chalmers International, a division of Allis-Chalmers Manufacturing Co., Milwaukee; **Paul Dietz** and **F. J. Mischke,** named associate directors of sales. Other appointments within the company include: **K. S. Wyman,** general patent attorney; **J. W. Kerwin,** assistant general patent attorney; **A. D. Foote,** assistant director of purchases.

A. M. Over, elected vice president, The Rust Engineering Co., Pittsburgh.

T. J. Gorman, appointed director of purchases, Quaker Rubber Div., H. K. Porter Co., Philadelphia.

D. G. Hill, president, Pittsburgh Plate Glass Co., will assume additional duties of chief executive officer.

W. B. Jones, appointed sales manager-agricultural products, Crucible Steel Co. of America, Pittsburgh.

Fernand Dugal, appointed works manager, Sorel Industries Ltd., Sorel, Canada.

E. F. Brinker, appointed manager, highway product sales, Aluminum Co. of America, Pittsburgh; **W. S. Ellis, Jr.,** named manager, residential sales; **C. G. Kiskaddon,**

JONES & LAMSON
OPTICAL COMPARATORS

the man who needs
a new machine tool is
already paying for it

Simulated machining operations give production control as well as absolute inspection

At J & L we answer an inspection problem by asking, "How was the piece made?"

Take, for instance, this inspection of broached slots in turbine discs. Holding fixtures are similar to those used in the actual broaching operation. Measurements are taken, right and left, as on the broaching machine. During inspection, the part moves in the same planes as it does while it is being machined. And the combination of light, optics and chart act as the cutting tool.

Through this visualization of the machining operation, it is a simple matter for the operator to take measurements on the comparator and then go back to the broaching machine to make any necessary adjustments.

Thus, with J & L, you not only inspect end products but, more importantly, you find out *where* and *when* to adjust the manufacturing process. Write to Jones & Lamson Machine Company, 511 Clinton Street, Springfield, Vermont, for literature.

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Jr., named assistant to the manager, industry sales.

R. J. Horning, appointed manager, roll grinder sales, Farrel-Birmingham Co., Inc., Ansonia, Conn.; **H. J. Hauser,** named assistant sales manager, Consolidated Machine Tool Div., Rochester, N. Y.

J. A. Neubauer, elected president, Columbia-Southern Chemical Corp., subsidiary of Pittsburgh Plate Glass Co., Pittsburgh.

R. A. Norman, appointed administrator, patent properties, Semiconductor Products Dept., General Electric Co., Syracuse, N. Y.

R. H. Smith, appointed technical manager, present product lines, Engineering Div., American Machine & Foundry Co., New York.

R. C. Moffitt, appointed vice president-purchases, U. S. Steel Corp., Pittsburgh. He succeeds **C. A. Ilgenfritz,** who is retiring.

In central operations at Fairless Works, U. S. Steel Corp., Morrisville, Pa., the following appointments were made in the Maintenance and Utilities Div.: **W. E. Williams, Jr.,** general foreman, fuels and instruments; **W. H. Lukens,** general foreman, transportation and general services; **P. J. Mays,** foreman, maintenance, vessel dock; **Nicholas Evanovich,** general foreman, vessel dock.

Advancements in the Blast Furnace Department included **E. A. Culiberg,** labor foreman; **T. E. Loomis,** turn foreman, stockhouse, trestle and ore yard; **R. D. Salmon** and **C. L. Rolison,** turn foreman, furnaces; **J. D. Haney,** foreman and **F. C. Kalmbach,** general foreman, sintering and screening.

In the Metallurgy and Inspection Department, **M. E. Pohl,** named turn supervisor, sheet mill, physical testing; **D. A. Venseret,** named metallurgist.

Other appointments include **J. M. Graubard,** general supervisor, project engineering, Engineering Dept.; **D. J. Barrett,** general foreman, cold reduction, Sheet and Tin Div.; **C. W. Larson,** engineer, roll and guide design, Rolling Div.

M. D. Millard, named assistant vice president-sales, American Steel and Wire Div., U. S. Steel Corp., Cleveland.

American Ship Building Co., Cleveland, announces the following appointments: **E. B. Williams,** vice president-sales; **S. A. Midnight,** vice president-engineering; **Oscar Hayes,** manager, Lorain shipyard; **Gordon Stafford,** assistant to the vice president-operations.

H. B. Maguire, named general manager-sales, American Steel and Wire Div., U. S. Steel Corp., Cleveland.

I. R. Zwick, elected treasurer, Solar Steel Corp., Cleveland.

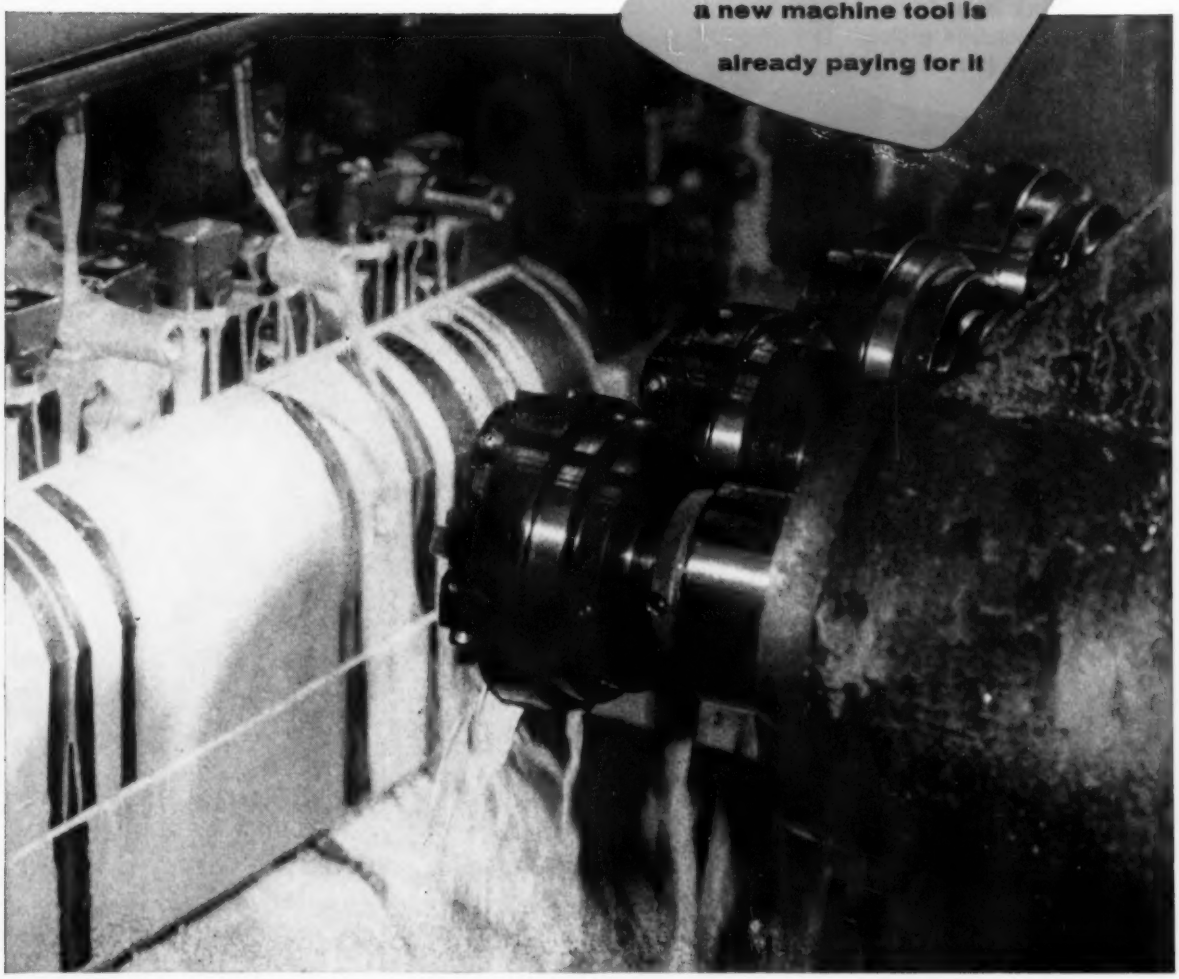
R. K. Lohman, appointed sales manager, Cargotainer Div., Tri-State Engineering Co., Washington, Pa.

R. T. Goodwin, Jr., appointed marine sales engineer, Dravo Corp., Pittsburgh.

Goodyear Tire and Rubber Co. announces the following appointments in its Industrial Products Div.; **R. J. Burns,** assistant general manager, Metal Products Div.; **H. F. Schweitzer,** St. Louis district manager; **W. A. Cooper,** Charlotte, N. C., district manager; **B. E. Mc-**

JONES & LAMSON
THREAD TOOLS

the man who needs
a new machine tool is
already paying for it



Wholesale Hollow Milling with J&L Die Heads

This is part of a transfer machine set-up that uses 48 J & L Die Heads on hollow milling operations. Rough and finish turning is performed on both ends of automotive suspension shafts, as 1440 finished parts come off the line every hour.

Even in single spindle set-ups, hollow milling chasers in J & L Die Heads remove metal *four times faster* than single point tooling. And in many cases, J & L threading Die Heads can be adapted to hollow milling, by merely using the required turning chasers.

Chasers for multiple turning and contour forming, as well as straight or taper turning, can be used in J & L Die Heads for hollow milling on most types of turning equipment.

Write for booklets — "Hollow Milling with Die Heads", and "Let's Talk about Thread Tools". Jones & Lamson Machine Company, 511 Clinton Street, Springfield, Vermont.

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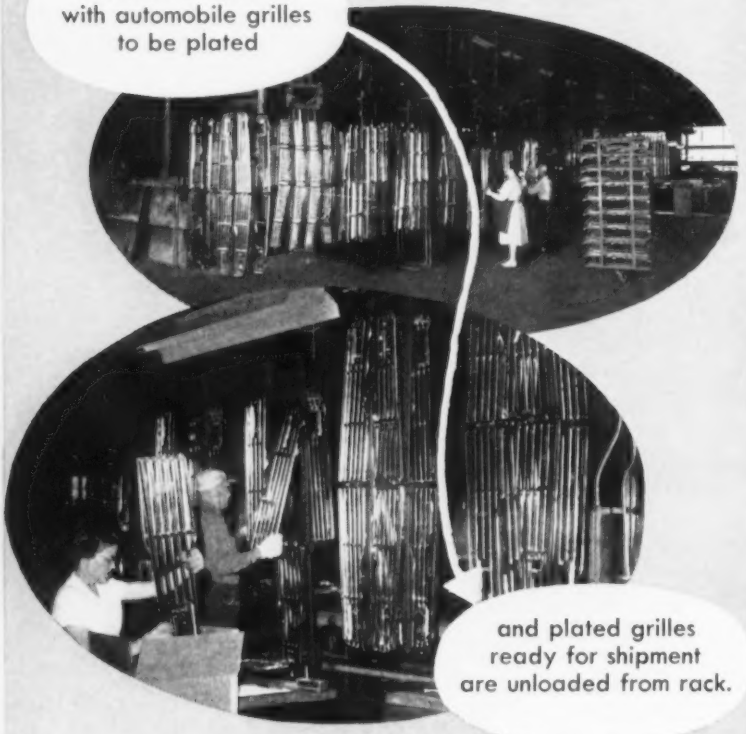
Every 57 Seconds

A rack is loaded with automobile grilles to be plated



and plated grilles ready for shipment are unloaded from rack.

The Udylite Plating Machine at the Jackson, Michigan plant of Ryerson & Haynes, Inc., is fully automatic with automatic rack handling as an integral part of the machine.

The racks, loaded with grilles to be plated, automatically move from the plant conveyor to the Udylite machine to start the twenty step cycle of precision nickel and chrome plating.

Then, after the processing cycle is completed, racks of plated grilles move automatically from the Udylite Plating Machine onto the plant conveyor and into the packaging and shipping department.

With automatic rack handling, chance of damage and human error are reduced to a seemingly impossible minimum. This is particularly important after nickel-chrome plating, when the grilles carry an investment of plating time and materials.

Ryerson & Haynes, Inc. have enjoyed the benefits of this Udylite machine since January of 1955. Production has been constant, two or three shifts a day, five to seven days a week.

You, too, can lower and reduce rejects with Udylite production plating and automatic handling equipment. Write us today.

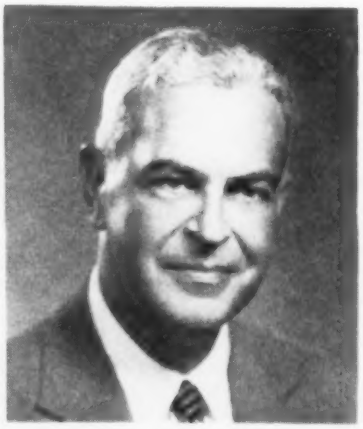
THE Udylite CORPORATION DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

Clelland, assistant district manager, New York City; **Westi Hansen,** assistant district manager, Chicago; **H. E. Morse,** director, industrial products development; **D. E. Harpfer,** manager, industrial products technical liaison; **J. H. Gerstenmaier,** manager, industrial products development; **J. J. Hickey,** manager, industrial products development for international plants.

C. S. Rockwell, named president and general manager, Ford Instrument Co. Div., Sperry Rand Corp., Long Island City, N. Y.

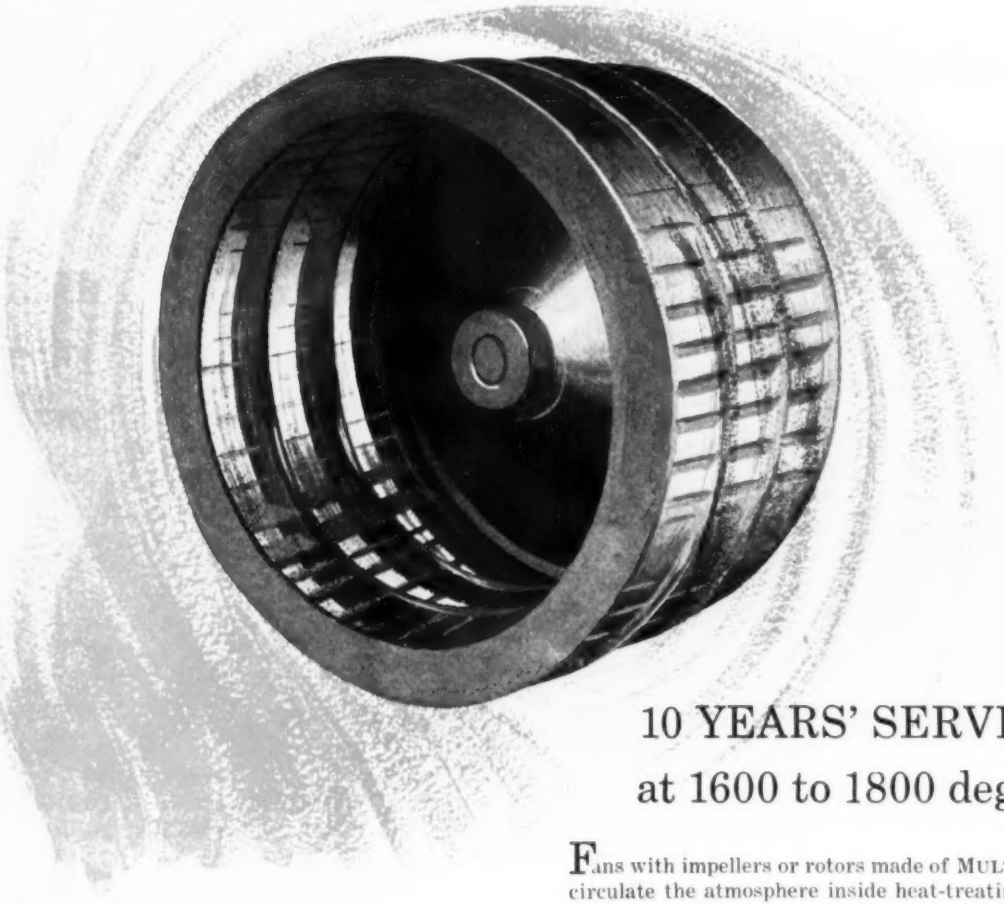
Dr. K. C. Karde, named director of engineering, research and development, Miehle-Dexter Supercharger Div., Miehle-Goss-Dexter, Inc., Racine, Wisc.



J. P. Raugh, named vice president and general manager, Refractories Div., H. K. Porter Company, Inc., Pittsburgh.

G. H. Robertson, Jr., assigned to the New York sales area. The

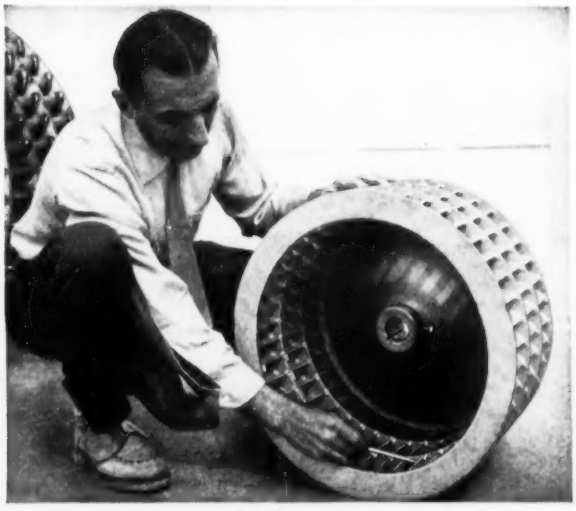
HAYNES Alloys solve the *tough* heat problems



10 YEARS' SERVICE at 1600 to 1800 deg. F.

Fans with impellers or rotors made of MULTIMET alloy circulate the atmosphere inside heat-treating furnaces and are exposed to temperatures from 1600 to 1800 deg. F. They withstand both reducing and oxidizing conditions produced during cyaniding, annealing, and nitriding operations. Their average life is about 10 years.

MULTIMET is one of 12 HAYNES alloys specifically designed for use where strength at high temperatures is essential. For details on properties, forms, and prices send for descriptive literature or contact our nearest sales office. HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, General Offices and Works, Kokomo, Indiana. Sales Offices in Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, San Francisco.



Designed to operate at 1800 deg. F., this impeller has 180 blades formed from MULTIMET alloy sheet. Impellers range from 12 to 48 inches in diameter. Furnace rotors, cast of MULTIMET alloy, operate at temperatures up to 2100 deg. F.

HAYNES ALLOYS

HAYNES STELLITE COMPANY

Division of Union Carbide Corporation

Kokomo, Indiana

UNION CARBIDE

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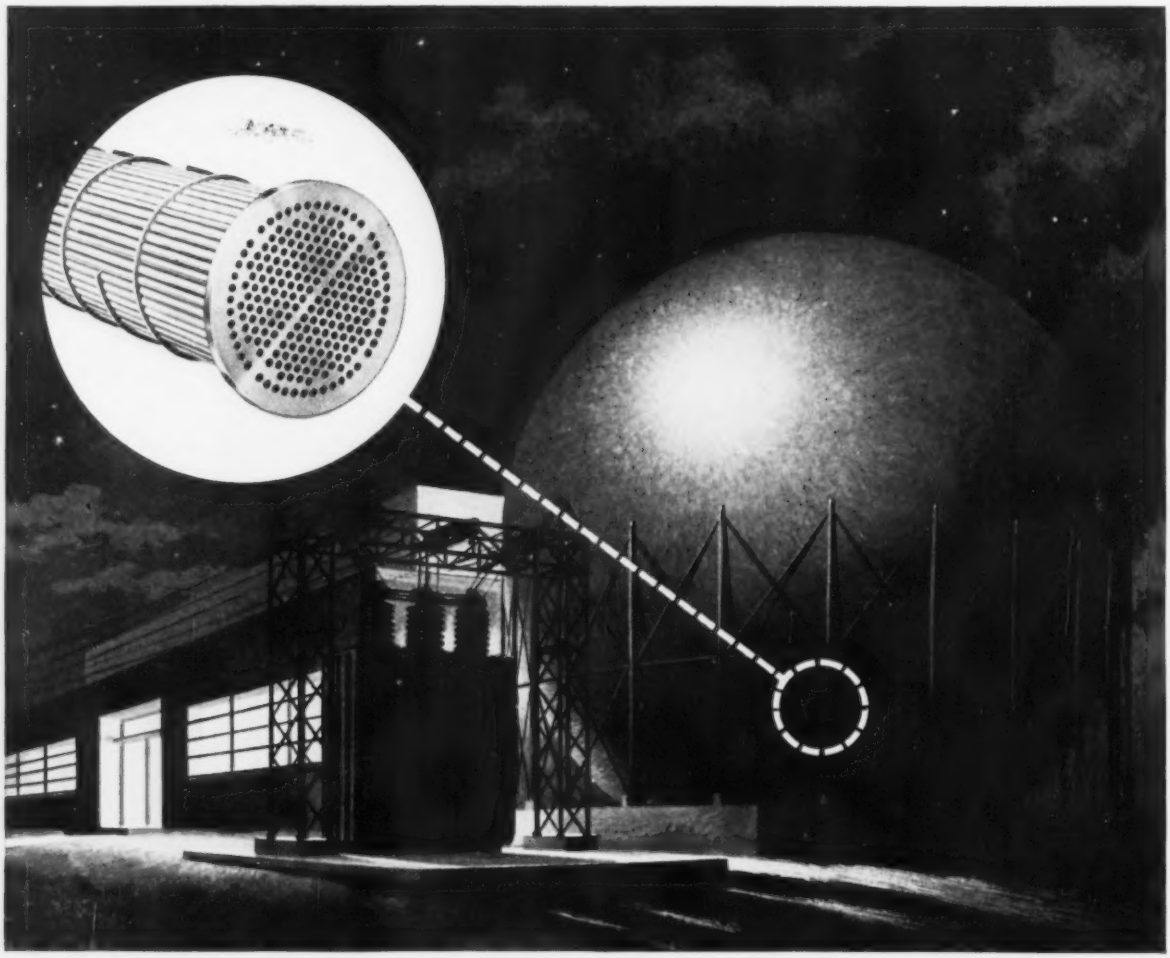

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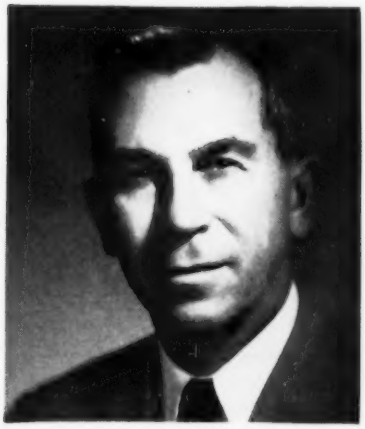
J. D. Saussaman, appointed division superintendent, Iron and Steel Div., Kaiser Steel plant, Fontana, Calif.

W. D. Crawford, appointed manager, Eastern Div., The National Supply Co., Pittsburgh.



W. E. Stewart, named manager of production engineering, American Welding and Manufacturing Co., Warren and Niles, O.

L. E. Toews, appointed sales representative, Firth Sterling (Canada) Ltd., Ontario.

J. M. Fox, appointed Hampstead plant manager, Black & Becker Manufacturing Co., Towson, Md.; **K. B. Salanda,** named director, industrial and plant engineering; **W. B. Ford, Jr.,** named Towson plant manager.

OBITUARIES

F. R. Hoadley, Sr., 67, retired president, Farrel-Birmingham Company, Inc., Ansonia, Conn.

P. J. Wenz, 63, manager-Service and Repair Div., De Laval Steam Turbine Co., Trenton, N. J.

D. P. Brannin, 69, retired Western District sales manager, New Jersey Zinc Co., New York.

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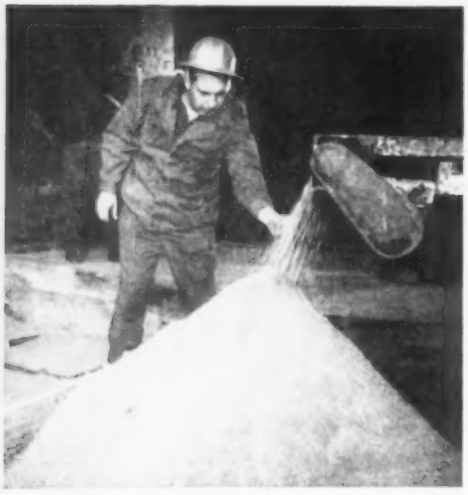

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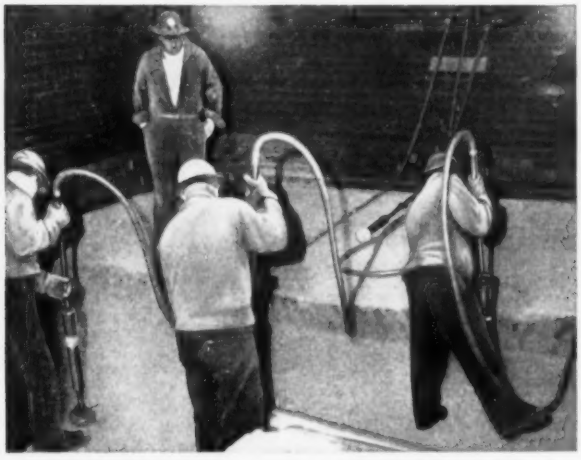
RAMMERS COMPACT 165 against back wall as furnace bottom nears completion. When on line again, furnace will produce 300 tons of steel per heat.



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New Method Cuts Cost of Short Run Stamping

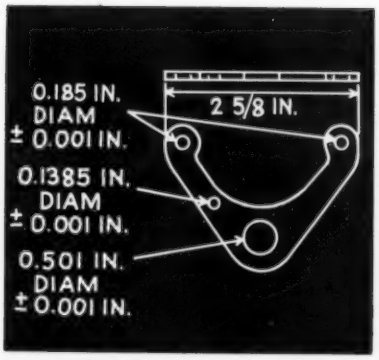

FIG. 1: Low-cost die and special piercing fixture hold blank tolerance on this part to ±0.002 in. and hole location to ±0.0015 in.

Proof that the long way may ultimately be cheapest is this new process for making close-tolerance short-run stampings.

It requires special fixtures, and calls for a separate punching operation on each hole; actual production costs more than with regular tooling. But final cost per piece runs much less.

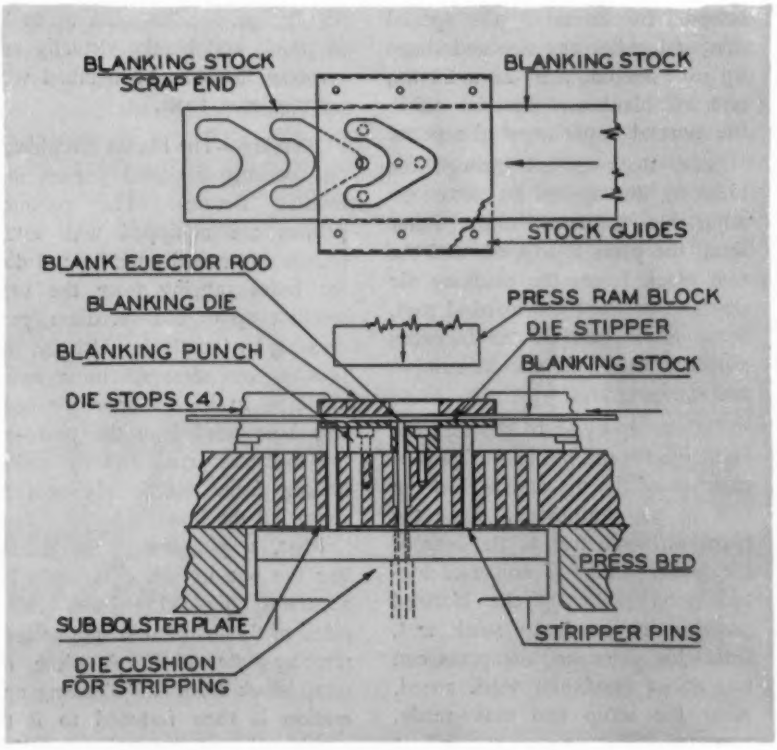

FIG. 2: Blanking-die setup is simple but accurate. Parts like the one shown are turned out at rates up to 250 pieces per minute.

▪ The most obvious way to cut costs is to eliminate steps. But because it's so obvious and works in so many cases, we tend to overlook a basic fact: that sometimes the roundabout method, or just plain more expensive process, will be cheaper in the end.

A good example of this is the way in which small lots of stampings are made by Dayton Rogers Mfg. Co., Minneapolis. Instead of trying to shave pennies off the production end, Dayton Rogers went back to where cost on short runs is affected most—the dies.

The result is a patented method that actually adds steps and makes production costs several times higher; but it's done with dies that run only 10 to 15 pct the cost of conventional dies, making overall cost per piece much lower.

Just As Accurate—The main difference in the new method is the fact that hole-punching is done as a separate operation. It eliminates the most expensive feature of conventional tooling but achieves the same degree of accuracy, especially in size and relative location of holes.

Use of the system isn't limited only to short-run production: it also serves as an inexpensive way to take a design through developmental changes before making the regular dieset for long production runs.

That the method has merit is shown by its creator's sales—the firm is making about 100 different dies a week and filling some 300 orders for stampings (two-thirds are reorders) in the same period.

Holds Close Limits—A typical

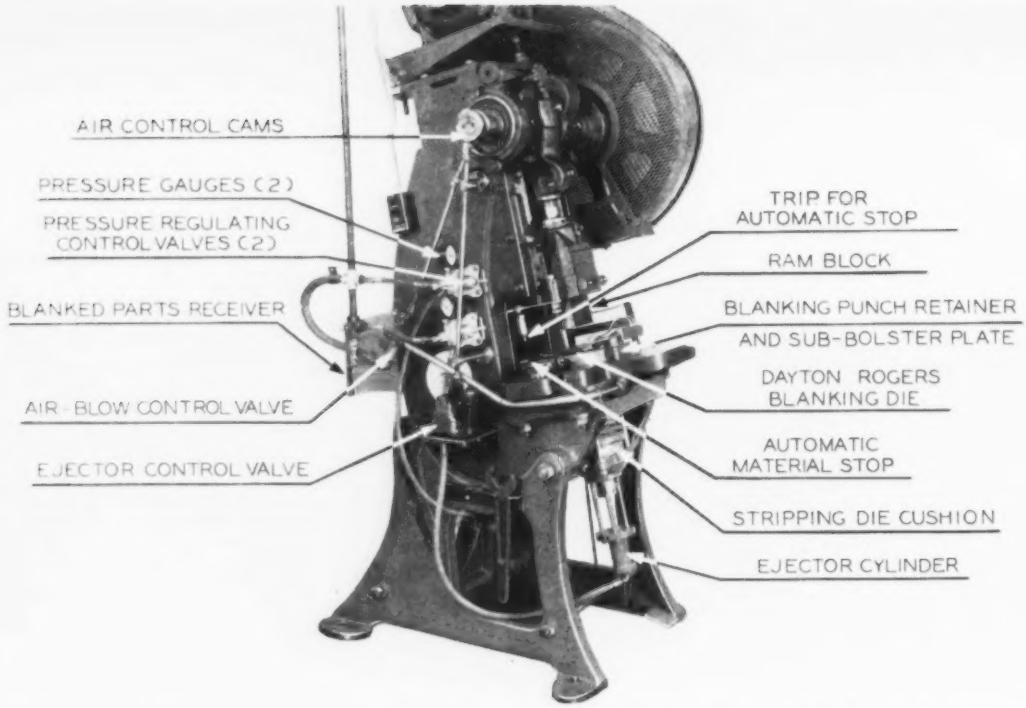

FIG. 3: Converted OBI press has a universal adapter that will handle any shape and size blanking die up to 22 x 22 in. The special dies and press will blank virtually any material up to ¼ in. thick.

part being turned out in quantites of about 1000 pieces per year is shown in Fig. 1. The overall blank profile tolerance is ±0.002 in. Hole locations are held to ±0.0015 in., and hole diameter tolerance is ±0.001 in.

First, a specially designed cushion blanking die is made for the part. Next, the blanking die and punch go on a special sub-bolster plate as in Fig. 2. The blanking die is merely nested or located over the fastened punch, and is guided through its work cycle by a combination guide and nest stripper.

Four adjustable die stops keep the die from rising off the blanking punch. Together with the stripper they keep the blanking die in the correct horizontal or lifting position at all times during the work cycle.

Uses Converted OBI—A rebuilt open-back inclinable press, Fig. 3, is used for blanking. It has an all-hardened and ground ram block which gives the blanking die the required pressure. The press is equipped with a patented universal adapter for mounting the special dies; it handles any size and shape up to a maximum of 22 x 22 in., and will blank any material within the normal capacity of the press.

Strip stock is fed through the blanking die against an automatic adjustable material stop. After setup the press is tripped, and the ram block forces the blanking die down to produce the blanked part. Scrap is stripped off the blanking punch by the pneumatic die cushion and stripping pins.

On the up cycle of the ram the blank ejector rod pushes the blanked part out of the die and against the face of the ram block. Then the blank is blown free to the rear of the press. The full universal material-stop picks up the blanked position in the scrap stock and, from this point on, the press can run at its maximum work speed. After the setup and make-ready, parts of this type are run off at the rate of 100 to 250 pieces per minute.

The process works on practically any design, handles stock up to ¼ in. thick and blanks virtually any material that can be blanked with conventional tools.

Piercing—The blanks are pierced on specially designed presses and holding fixtures. The patented presses are equipped with interchangeable round punches and dies for holes ranging from the very smallest up to 1½ in. diam, progressing by 0.0005 in. Usually, the presses are arranged in a semicircle as in Fig. 4—one for each size hole needed in the part—so the operator need only swing around from one to the next to pierce all the holes.

First, a piercing jig or fixture like the one in Fig. 5 is made by accurately jig-boring holes in a piece of 3/32 to ¼ in. normalized piercing-plate steel. A piece of scrap stock from the blanking operation is then fastened to it to provide the nesting or means for holding the blanked part in perfect alignment.

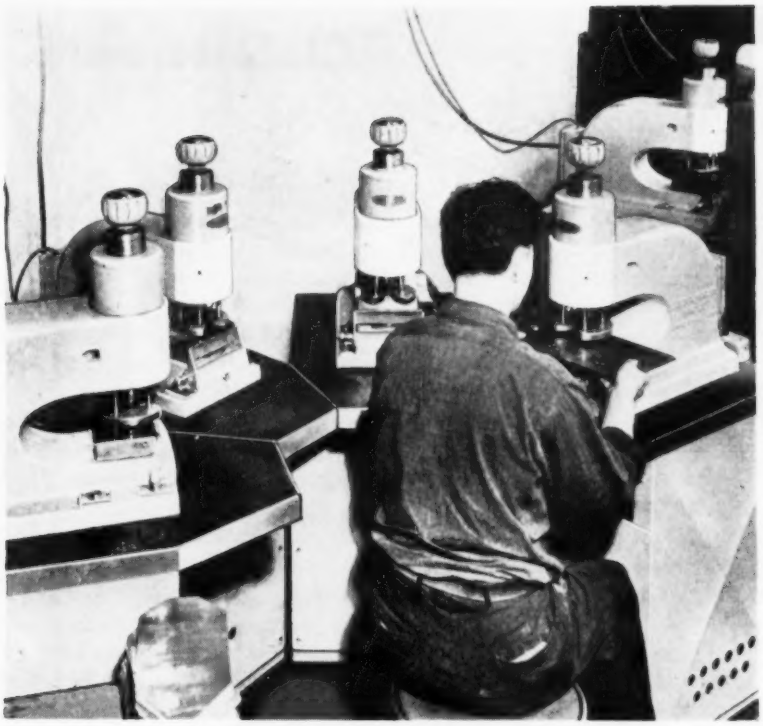

FIG. 4: Special automatic piercing presses are arranged in a semicircle so the operator has one close at hand for each size hole.

When the blanked part (A, Fig. 6) is positioned in the nest (C), the piercing fixture (B) is placed in working position. This automatically closes the electric circuit and magnetizes the stripping plate (G), which is followed by the action of the bottom ram (F). The piercing press then goes through its entire cycle automatically.

The magnet stripper holds both the piercing fixture and work piece in place during the cycle, releasing them when the current cuts off. Then the combination electric magnet and stripper sheds or strips the blank off the piercing punch (D) by means of the pressure stripping pin (J). If the next hole is a different size, the piercing jig is moved to the next press and the piercing operation is repeated.

Starts and Stops Itself—The press doesn't even have to be tripped by the operator. Once the work is in position the press automatically trips itself, completes its cycle and comes to a stop ready for the next operation. It's not uncommon to have six of the special presses set up to make six different holes on a single part.

A major difference between the Dayton Rogers press and conventional piercing presses is that the action is inverted. The piercing punch remains completely stationary on the ram side of the press, while the piercing die is carried on the reciprocating section of the ram. The ram operates through what would be the bolster plate on a regular piercing press.

The work cycle is electrically controlled, having an electric lockout so the press can't two-cycle on any one piercing operation. The presses are self-contained and can be moved from place to place—all power comes through an extension cord plugged into any convenient outlet.

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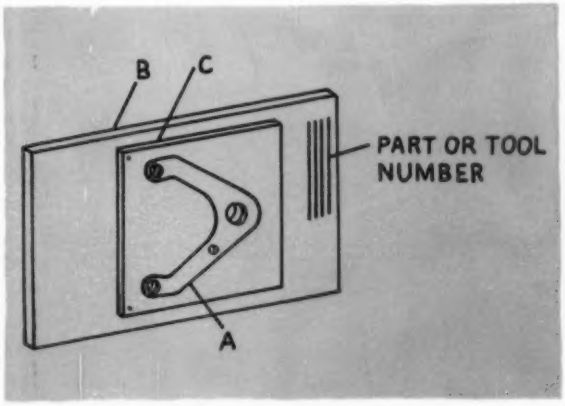


FIG. 5: Blanked part (A) is pierced in holding fixture made of jig-bored steel plate (B) and scrap from the blanking operation (C).

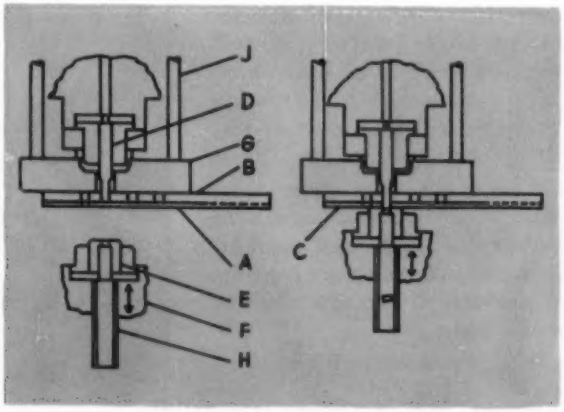


FIG. 6: Action of the piercing press is inverted; the punch remains stationary and the die moves up and down on a reciprocating ram.

How To Select A Vacuum Arc

By L. L. Johnson—Industrial Heating Dept., General Electric Co., Schenectady

There are five keys to success in choosing vacuum arc melting equipment. Omitting any one of them could saddle you with the kind of equipment that won't fit your requirements.

Here's an expert's analysis—designed to make your purchase easier, lots more productive.

▪ The engineering advantages of vacuum arc melted metals are gaining more and more recognition. Demand for these materials is on the upswing. And along with this growing popularity, there is an increasing demand for new vacuum arc melting equipment.

What criteria should be considered in selecting such equipment?

Certainly, these five factors should be kept in mind: 1) ingot size required, 2) electrode size and formation, 3) the vacuum system, 4) the power supply, and 5) safety, work handling, and housing aspects.

Cut Waste—End products should determine ingot size. The ingot should make an even number of required parts with a minimum of waste.

Frequently, the equipment available for processing the ingot will determine economical dimensions. This is particularly true of extrusion equipment and, to a lesser degree, rolling equipment.

When ingot sizes must vary, select a furnace large enough to produce the largest ingot required. Then use smaller diameter crucibles or partially fill the crucibles for smaller ingots.

It is reasonably economical to produce ingots with a diameter range of 2 to 1 in the same furnace. If a larger range of diameters is desired, consider installing different furnace sizes.

Major Factor—The diameter of the largest ingot to be melted is the major factor in determining power supply and vacuum system needs. Thus it is basic in determining melting equipment costs. An increase in ingot length will not affect furnace cost nearly as much as a proportionate increase in diameter.

Since power supply, vacuum system, downtime between melts, and top cropping are essentially the same for a given diameter ingot, it is economical to make the maximum weight ingot as long as possible.

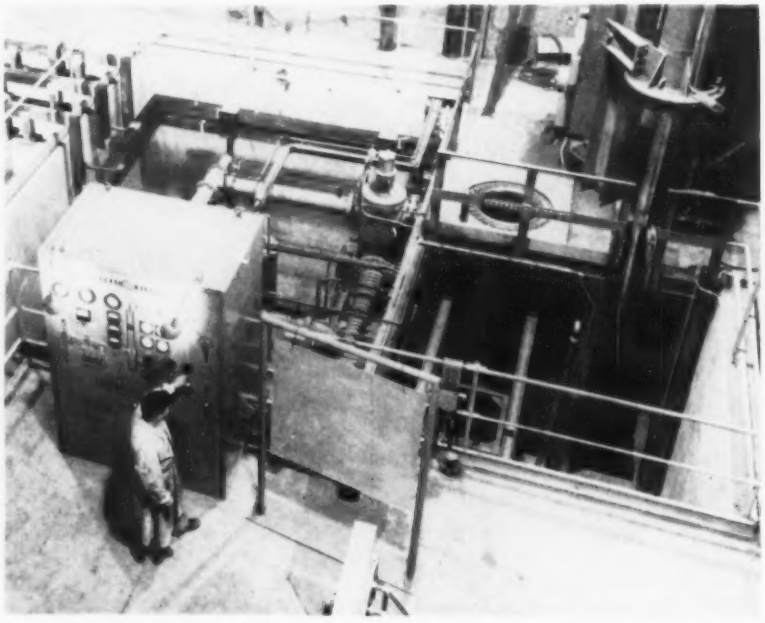
In general, the ingot length should not exceed five times the diameter. Ingot extraction depends on shrinkage of the ingot during cooling to provide clearance between the ingot and the crucible wall. A slight distortion of the ingot or crucible can make it difficult to extract an excessively long ingot.

About Electrodes—Always consider the electrode needed to make the desired ingot before making a final decision on ingot size. The electrode must be large enough to produce the desired ingot and provide some handling length.

At the start of the melt, the tip of the electrode is at the bottom of the crucible. All evacuated gas must pass between the electrode and the crucible walls. In most cases, adequate clearance for gas removal will also constitute adequate electrical clearance.

However, when the furnace is very small or square electrodes are used, clearance may be critical. Small furnaces have been successfully operated with ½-in. clearance between electrode and crucible wall.

Maximum Diameter—Still, it is preferable to have at least 1-in. clearance between electrode and crucible wall. An additional inch should be allowed for warpage of the electrode and errors in guiding.



TOP VIEW: Despite the amount of equipment involved in preparing a vacuum-melted heat, one operator can control variables at panel.

Furnace

This means that the maximum electrode diameter should be at least 4 in. smaller than the crucible diameter whenever possible.

The high electrical current passing through the electrode generates a lot of heat. Very little of this heat can be removed by convection or conduction. Electrode temperature tends to increase until radiation losses balance the resistance heating or the current is turned off.

Such elevated temperatures can weaken electrodes to the point of breakage. Therefore it is wise to calculate anticipated electrode temperatures in advance.

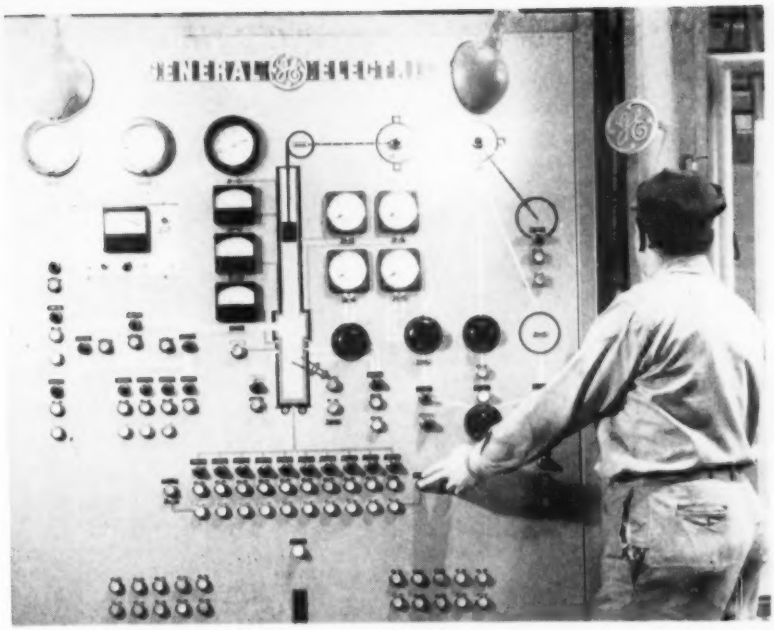
Basic Rule—When a furnace is to be used for several ingot sizes, the maximum electrode length and headroom required will generally be fixed by the electrode size needed for the smaller diameter ingot.

The electrode will always be longer than the ingot. In general, the ratio between length of electrode and ingot will increase for smaller diameter ingots because the area required for electrical clearance and gas removal will represent a larger portion of the total crucible cross sectional area.

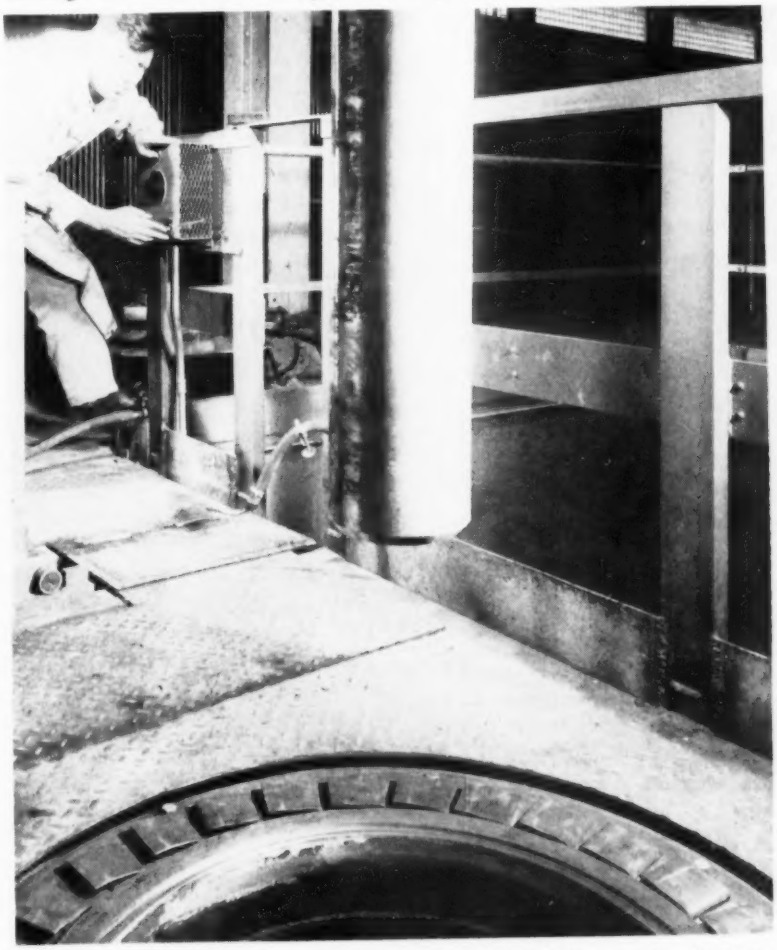
How They're Made—There are several methods for forming the electrode. It may be previously melted or made up of two or more ingots welded together. If previously melted, vacuum arc, vacuum induction, or conventional melting processes may be used.

The electrode may also be formed from pills or briquettes that are sintered or welded together. Pills and briquettes are made by pressing a mixture of powdered or granulated metals. This method of forming first-melt electrodes is common in melting titanium and zirconium.

Powder and Sponge—Some electrodes are formed by placing the



ALL-IN-ONE: Single control panel handles variety of conditions, including arc current and voltage, furnace pressure, and cooling.



GOING DOWN: Operator is shown lowering electrode into vacuum furnace. Furnace capacity must depend on requirements of ingot sizes.

Five key factors provide a buyer's guide to new equipment

powdered or granulated metals in a plastic or rubber container which is subjected to very high hydrostatic pressures. This is an economical method for forming electrodes of the reactive metals which are available in powder or sponge form.

Selection of a vacuum system depends on the gas evolution rate and furnace pressure desired. Many factors affect gas evolution rate. So that it is often desirable to make one or more carefully controlled test melts, using the data obtained to select the vacuum system for a new furnace.

Estimate Gases—An approximation of gas evolution rate is possible when the kinds and amounts of gases present in the electrode can be estimated and the manner in which these gases will be removed can be predicted.

Hydrogen may come off as a molecular gas and remain as such until exhausted from the vacuum system. Magnesium chloride, on the other hand, is gaseous only at high temperatures and occurs in the vicinity of the arc. Such a gas will condense before reaching the vacuum pumps. It will affect total pressure in the area of the arc and the molten pool. It will not affect pressure at the intake to the vacuum pumps.

Solid or Gaseous—Oxygen may be removed as molecular oxygen or as a gaseous or solid compound. If it is removed as carbon monoxide, its volume is doubled. As a solid compound, it remains in the molten pool and floats upward as the ingot is formed. Such slags can eventually be cropped from the top of the ingot.

Performance curves for vacuum pumps apply to the pressure at the vacuum pump entrance. Pressure in the area of the arc and immediately above the molten pool will be somewhat higher. The pressure differential between the molten pool and the vacuum pump entrance can be reduced by using large diameter vacuum piping and locating the vacuum pumps as close to the furnace as possible.

Vacuum Pumps—If the vacuum pumping system has more pumping capacity than necessary, the furnace will operate at lower pressure and will normally produce a better quality product. If higher pressures are desired, it is easy to bleed in an inert gas to load the pumping system.

At present, there are two general types of vacuum pumps available: the mechanical booster type and the oil vapor type.

The mechanical booster pump provides fairly uniform pumping speed (cfm) over a broad range of pressures. This characteristic helps it to compensate for gas bursts during melting and makes it more adaptable to a wide range of melting conditions. At pressure above 40 microns, the mechanical booster system appears to be less costly for a given capacity than the oil vapor pump.

Use Correctly—The oil vapor pump normally gives peak performance over a relatively narrow pressure range. If gas evolution rate exceeds the pump's capacity, a backup pump takes over and the oil vapor pump becomes a useless impediment in the circuit.

Obviously, it is important that an oil vapor pump be correctly applied. At present, only the oil vapor pump can produce high pumping rates in the range below 20 microns.

There is not enough evidence available to properly weigh the difference in performance of metals melted at 100, 50, 25, 10, and 5 microns or lower. There are indications that there may be critical pressures for various metals.

Dual Melts—If this is the case there will probably be extensive use made of double melting techniques similar to those now used for titanium. A large percentage of the gas will then be removed at relatively high pressures (100-500 microns) with a fairly inexpensive vacuum system. The second melt will be at very low pressures. A low capacity, high vacuum pumping system will be required because most of the gas will have been previously removed.

Most commercial vacuum arc melting is done today with direct current obtained from selenium rectifiers. Germanium and silicon rectifiers show promise of longer life, more efficiency, and more compactness. Voltage current characteristics of the power supplies are similar to those used for arc welding: approximately 80 v open circuit, 40 v at rated current, and 0 v at double rated current.

Choosing Current—In most installations the electrode is negative and the ingot positive. Reversing the polarity reduces the melting rate and produces a slightly deeper molten pool.

Several alternating current furnaces are in successful operation. The major objection to alternating current melting is that the arc must reverse 120 times per second. This makes it more difficult to start and maintain a stable arc.

Arc currents of from 500 to 2000 amps per in. of ingot diameter have been used. An arc current of about 1000 amps provides optimum molten pool depth and produces ingots with best surface condition, minimum inclusions, and best grain structure.

Some Flexibility—Optimum arc current varies for different metals and ingot sizes so the rule-of-thumb of 1000 amp per in. of ingot diameter cannot be taken too literally.

Melting rate depends largely on arc current and arc voltage. High burn-off rates are achieved at high arc voltages. However, higher voltages promote spatter and an unstable arc. This combination may result in a poor surface condition and increase the danger of burning through the crucible. With a short, low-voltage arc, the melting rate

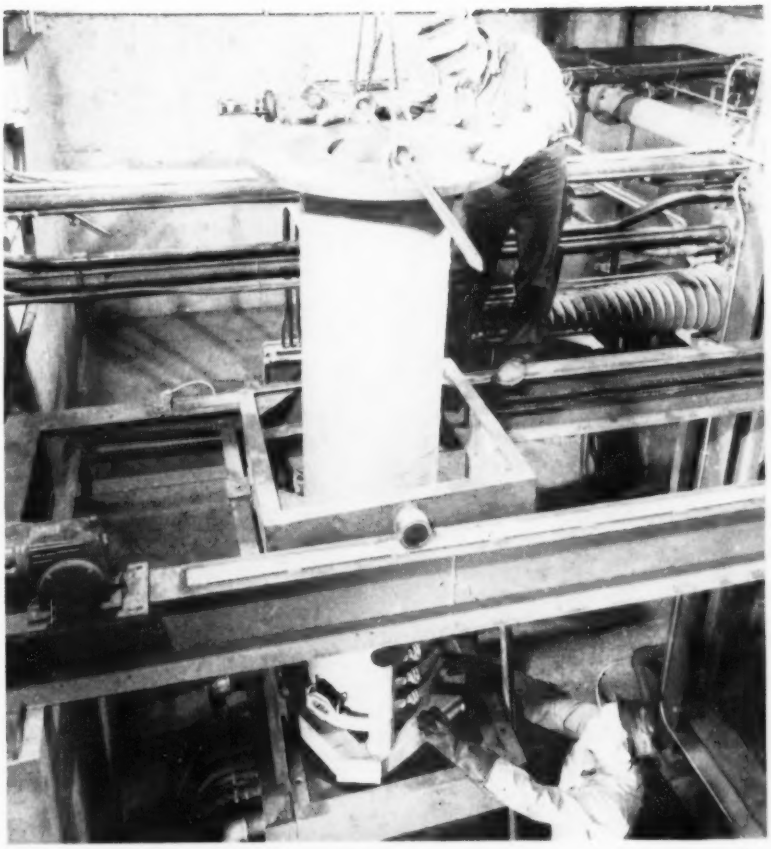
will be about 1 to 2 lb per minute per 1000 amp.

Controls Needed—During a melt, it is possible to control arc voltage, arc current, furnace pressure, "stirring coil" current, and cooling water temperature and pressures. In melts where a gas is added to the furnace atmosphere, the flow of the gas can also be controlled.

In controlling these variables, it is desirable for the operator to see what is happening in the area of the arc. A simple optical system can be used to throw an image on a screen.

Watch Voltage—The most important of the control functions is arc voltage. If voltage is too low, the electrode will stick to the ingot. If voltage is too high, there is arcing to the crucible sidewall and excessive spatter.

The arc voltage control system must be sensitive to very small changes in arc voltage. But it must also be sufficiently damped to avoid over-correcting for transient conditions such as drops of metal short-circuiting the arc. The speed of the corrective action should be proportional to the error signal.



MORE EQUIPMENT: Demand for vacuum-melted materials is on the upswing. Heavy melting requirements keep equipment makers busy.

Fine Adjustments—Present practice in most cases is to have the operator adjust the reference voltage by observation of the arc. This means that the operator must give close attention to the melt during starting and hot topping.

The arc current level controls the melting rate and the depth of the molten pool. It should be reduced during starting and hot topping.

In most existing installations, the operator increases or decreases the arc current in steps. Steps of 10 pct appear to be adequate in most cases, although it may be desirable to have variable control of one unit which can be used as a vernier.

Furnace Pressures—During most vacuum melting today, the operator has little control of furnace pressure. Once the melt has been started, the vacuum pumps operate at maximum capacity. The furnace pressures fluctuate with the gas content of the portion of the electrode being melted.

Some control of furnace pressure can be had by increasing or decreasing the arc current. But the range of this control is limited.

Where adequate pumping capacity is available, the easiest method to control furnace pressure is by bleeding an inert gas into the furnace or by vacuum piping.

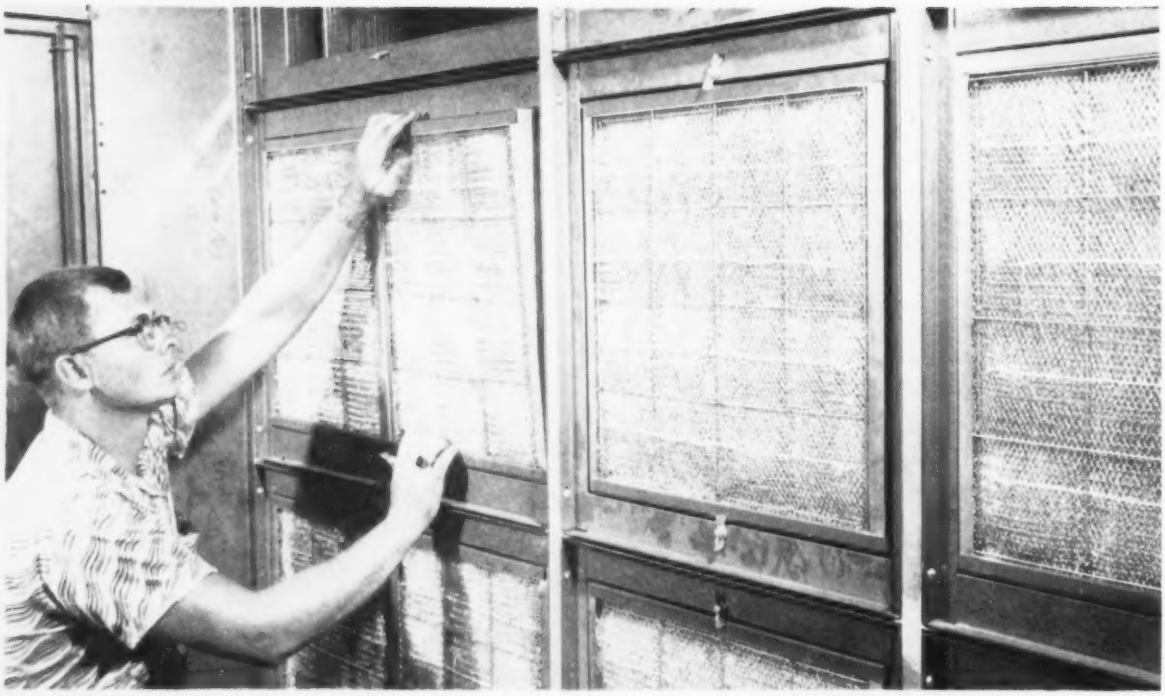
It is desirable that the operator be able to start and stop the vacuum pumps from the operator's panel. If an oil ejector pump is used, the operator should have control of the bypass valves.

Stirring Action — The "stirring coil" operates on direct current and is wrapped around the crucible. The interplay of the magnetic fields of the "stirring coil" and the arc current create a rotational force. This stirs the molten pool and rotates any arcs which strike from the electrode to the crucible wall.

The correct "stirring coil" power level represents a balance between arc stabilization, ingot surface condition, and ingot interior quality. The only measures of correct "stirring coil" power are previous experience or observation of the molten pool. It is always desirable to have a "stirring coil" ammeter or voltmeter.

Adequate Cooling—As a rule, it is not necessary to control cooling water flow or temperature during melting. But it is extremely important that adequate cooling water be supplied, particularly to the crucible. It is recommended that visual flowmeters and water exit temperature gages for each cooling circuit be provided on or near the operator's panel.

Also, flow switches and over-temperature switches should be provided to break arc power in the event of cooling water failure.



DUST CATCHER: Dry filters are installed in an electronic air cleaner at Minneapolis-Honeywell's new plant in Wabash, Ind. The filters needn't be changed when dirty; they're cleaned automatically.

Keep Plant Air Clean—Electronically

Dirt costs money—not only in terms of the labor required to remove it, but also in the damage airborne particles can do to people and machines.

Filters are fine, until you get down to particles smaller than three microns. This is where electronics takes over.

▪ A lot of progress has been made in coping with the air around us. We've learned to control its temperature, its humidity, its speed of ventilation, its distribution and how to clean it with filters.

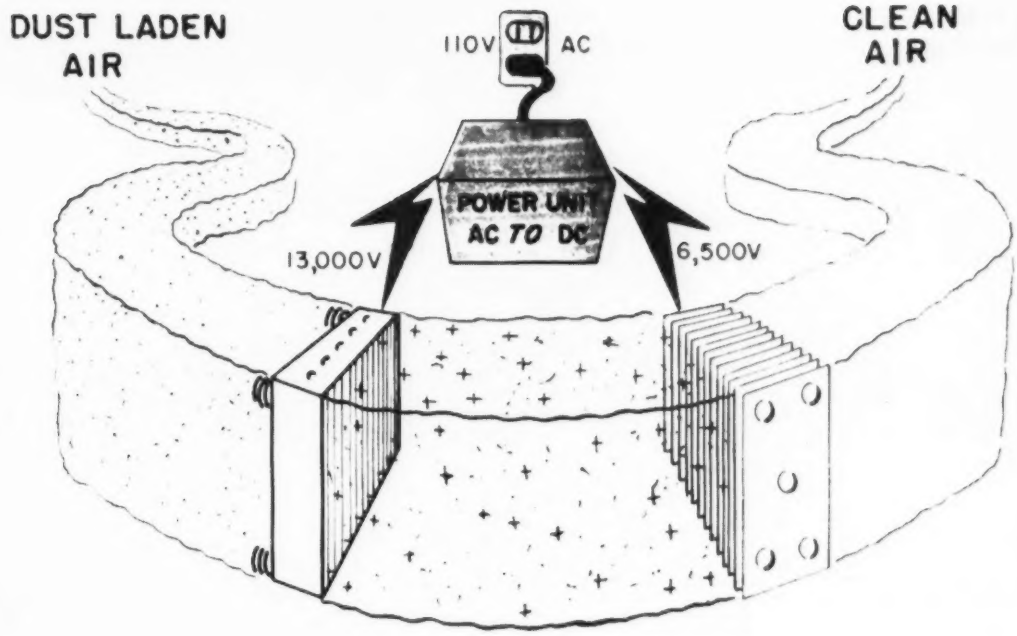
But much so-called "pure" air is not clean. It contains soil, sand, smoke, coal, dust, fly ash, fumes, ceramic particles, metal chips, paint, pollen, tobacco smoke, lint, fibers, bacteria, viruses and silicates.

Now, industry is moving into the next important era of growth in year 'round air conditioning: electronic air cleaning. At least half a dozen firms—Westinghouse, Minneapolis-Honeywell, Trion, American Air Filter, Dollinger and Air-Maze—have introduced air cleaning systems to combat pollution electronically.

Electronic air cleaning units are already being installed in the ductwork of many modern heating, ventilating and air conditioning systems. The units are available in various sizes and can be arranged so their air-handling capacity exactly matches that of the system's fans. This assures that all of the air will be drawn through the electronic air cleaner at exactly the right velocity.

How It Works—As dust atoms flow into the electronic air cleaner they pass through a high-voltage electrostatic field. Here they receive a positive charge. This overbalances the negative charge surrounding the atom and makes it a positive ion.

According to physical law, like electrical charges repel each other; opposite charges attract each other. Thus, the positive-charged ions are attracted to negative-charged collector plates and are repelled by alter-



CHARGE FOR ADMISSION: Dust particles are first given a positive charge in the 13,000-v ionizer section, then attracted to the negative 6500-v collector plates and washed away by a water spray.

nately-placed positive plates in the collector units. After being collected on the negative plates, the dust particles are automatically washed away by a water spray.

Although electronic air cleaning is not a new idea, it wasn't until recently that prices were brought low enough to make it practical. Prices for the Minneapolis-Honeywell equipment, for example, start at $660 for a home-sized unit (in time the company hopes to whittle this down to about $300). They range up to $8564 for the biggest unit, a high-efficiency commercial system that will remove 95 pct or more of the dirt in the air. A standard-efficiency unit capable of removing 90 pct of the dirt sells for $6136.

Cuts Maintenance—Because of the newness of such equipment little data have been gathered comparing operating costs of electronic air cleaners with the conventional mechanical filter.

This much, however, can be said: the electronic units shouldn't ever require replacement; they're designed to last the lifetime of the building, and of course need no regular changing of filters and the like. On an average, the cost of electronic air cleaning ranges from 15 to 21¢ per cu ft of air handled.

Dirt Is Costly—But the real economics of electronic air cleaning come to light when you consider the high cost of dirt in plants, office buildings, stores, hotels, apartments, banks, and other commercial and industrial establishments.

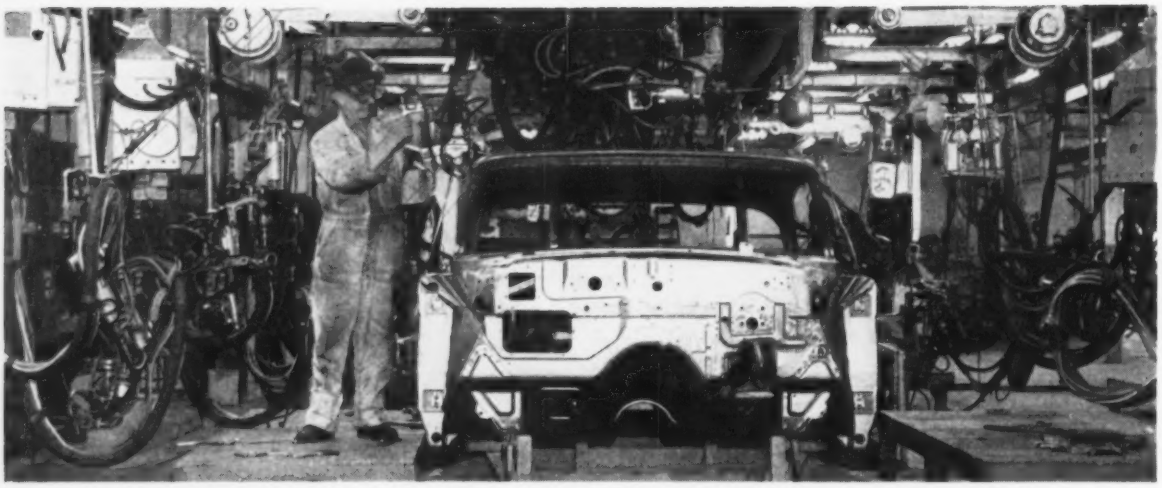
For example, the Northwestern National Bank of Minneapolis spends $175,000 a year to keep its office building clean. This includes $12,500 for washing the insides of windows. The building is completely redecorated every 30 months, and all walls must be washed before they are painted. It costs $10,000 a year to wash the walls in this typical office building.

In a study of 624 office buildings, it was found that owners spend 57¢ per sq ft per year to keep the rental space clean enough for occupancy. This represents 23 pct of the building's entire operating cost.

Even Removes Germs—All airborne particles have the ability to stain. But 50 pct of the staining power is in particles smaller than three microns. These are particles too small to be removed by most conventional air filters.

Present electronic air cleaning equipment can ionize and remove all known particles — including viruses — down to 1/1,000th of a micron in size. This is about 1/25,000,000 of an inch—as small as any disease-producing germ.

And this business of cleaning the air can amount to a $90-million annual market by 1962, according to a recent Minneapolis-Honeywell study. During the next five years the firm foresees a potential market of $70 million in commercial buildings and a $20 million domestic or residential business. The industry will reach this goal if only one-third of the commercial air conditioning plants and only 10 pct of the homes are electronically equipped by 1962.



PILOT LINE: Operator welds body sheet metal. Welding methods are checked for production effectiveness.

Pretesting Team Smooths Way For Production Changes

Yearly model changes in the auto industry create production snags.

Here's where one company has taken the bull by the horns and created a separate activity to deal with changeover problems.

It pays off in proving assembly techniques before being faced with tight production schedules.

▪ It's an independent activity that provides 100 pct pretesting of parts and tools for building new models at Mercury Div., Ford Motor Co. Called Manufacturing Development, it includes manufacturing engineering, quality control and production.

Mercury officials aren't saying they've eliminated the headaches that go with a model changeover. But they have the confidence that comes in having an organization able to cope with any situation.

Central Clearing — All parts, metal stampings, die castings, metal trim, and interior trim are cleared through the Manufacturing Development Building at the Warren Ave. plant, Detroit.

Metal stampings, usually made on Kirksite dies, are assembled using prototypes of the same tools that will be used later in production. Parts that don't fit properly or won't go together easily are set aside for redesign, rework or revised processing.

Two complete cars of each model are built at the Warren Ave. plant before a new design is released for production. Gages and fixtures are also built here so that completed bodies can be checked prior to release.

Gage on Wheels—The tooling includes a master gage for gate fixtures. Mounted on wheels, the master gage can be moved anywhere in the plant to check an assembly fixture.

Or, if necessary, it can be shipped to a distant assembly plant where tooling has been damaged. This step was taken, incidentally, several times during the past year.

The idea of pre-checking the ability of a plant to assemble several thousand parts into a motor car is not new. But, having the new department operate independent of plant manufacturing, engineering or purchasing is a new approach to an old problem.

Benefits in Setup—Here are some of the advantages that are inherent in the new setup:

1. Establishes a single clearing house for all parts and all tools required for a new model.

2. Frees assembly plants from many of the pressures that inevitably build up at new model time.

3. Provides a method whereby manufacturing tests or research can run concurrently with engineering and road testing.

4. Avoids duplication of effort and provides for development of a group specifically trained to look for "manufacturing bugs."

5. Offers an opportunity to introduce new cars and new tooling to officials of Mercury assembly plants several months in advance of the old method. There is an opportunity for these officials to make suggestions and to acquaint central staff executives with problems peculiar to certain assembly plants.

6. Makes it possible to clear design changes suggested by Engineering and Purchasing as rapidly as possible.

7. Provides a workable setup for adjusting differences of opinion that may arise between Engineering, Manufacturing and Purchasing.

8. Offers an opportunity to work directly with vendors if last minute assembly problems should develop.

How Big a Job—In introducing the plan last year, Manufacturing Development checked and assembled more than 3300 new parts, ranging from major stampings to die castings and fasteners. This group also checked all of the master tools and created many of the welding and assembly fixtures needed to build the new models.

This work continues for the model change coming this year. The number of individual parts that have to be checked will vary with the yearly changes made in a production model.

The new program may cut months from the period ordinarily required to bring a new model successfully into production. Problems in the assembly plants will be reduced for the most part to minor adjustments in tools and final minor changes in design to make it simpler to build or assemble a new model.

Mercury officials feel they can now eliminate many of the manufacturing "surprises" that have always been considered inevitable when a new car is introduced.

Short Run Dies — All major stampings are made on short run Kirksite dies while permanent tooling is being developed. The parts not only prove the new tools but also provide die-made parts months ahead of the former method.

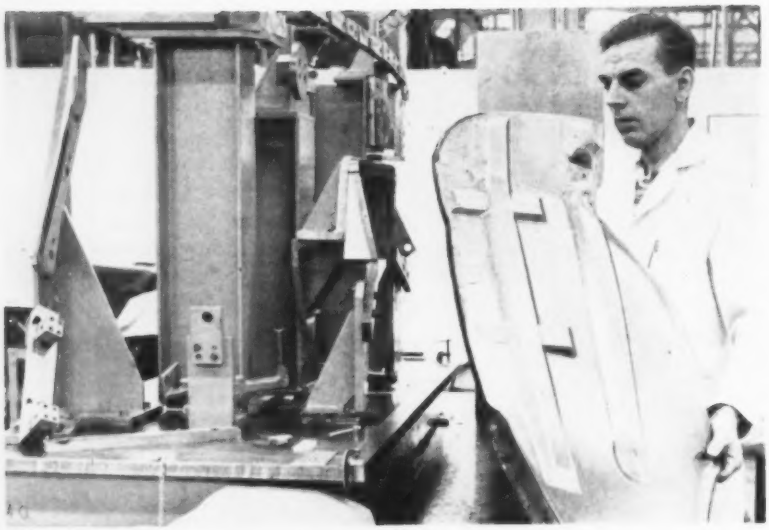
A number of cars are assembled from die-made stampings for testing at the Ford Proving Ground and on the road. Prior to assembly, however, all parts are checked on layout tables.

Manufacturing Development can take a much closer look at the manufacturing possibilities of the new designs. Using the new tools it designs, all of the parts are assembled at the Warren Ave. plant.

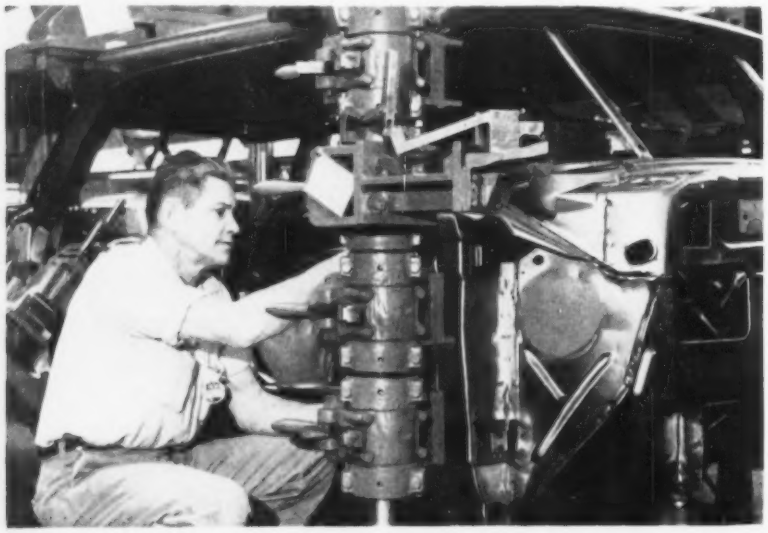
Key in Checks—Is the fit satisfactory? Will springback affect ability to assemble these stampings in production? Will stampings be distorted during welding? Can this welding fixture be improved? Will

GAGE INSPECTION: Inspector tests fixtures for tolerances so preassembled bodies can be checked.

DOUBLE CHECK: Wheel-housing plaster model forms master surface for fixtures to check sheet metal.



PART INSPECTION: Inspector places the front apron sheet metal against a checking fixture gage.



QUALITY CONTROL: Jig checks bodies for door and window openings at new station wagon plant at Wayne, Mich.

the Service Dept. be able to make repairs?

Asking the questions that used to be asked first by the assembly plants eliminates a lot of production headaches.

The new approach enables welding practices and fixtures to be proved out before the new body goes on the line. Sometimes a joint or a number of welds can be eliminated. Tests of the rigidity of the new design during assembly can be made.

Complete Job—In addition to making the first assembly fixtures and building the master tools, Manufacturing Development proves all manufacturing methods and assists in preparation of the written manufacturing procedures required for Mercury's four assembly plants and the new Mercury station wagon plant.

Vendors, whether a Ford Div. or an outside supplier, send samples of all parts to the Warren Ave. plant. While running tests of motors, transmissions, etc., are not made, representatives of Manufacturing Development visit these supplier plants to make various tests on motors assembled into cars.

Classify Tests—Tests made by the Manufacturing Development people fall into three broad classifications: (1) layout, (2) laboratory, (3) functional.

Layout tests are made only if assembly problems arise. Such tests serve as a double check of the work previously done by Engineering. Facilities are provided for making complete and accurate layout checks against master drawings.

Using the welding tools and fixtures a car can be assembled completely at the Warren Ave. plant. Checks, heretofore difficult to make, are included as part of the routine.

The outer panel of a door may be cut away to see if any clues can be found that might develop later into door rattles. Dozens of "little things" that used to be discovered first in the assembly plant or in the field are now detected before cars go into production.

Freeze Changes—Once a design is approved for assembly, that model is temporarily frozen. Only changes marked "Mandatory" are approved until after the new cars are in production. This usually occurs six to eight weeks ahead of the introduction date.

Meanwhile, engineering and field tests may disclose changes that can be made to improve performance, insure greater safety or permit economies in materials or manufacture.

Manufacturing Development evaluates all suggestions by engineers and others. Once production gets well under way in the assembly plants, suggestions that prove out are released for production.

It's an efficient method of solving the manufacturing problems incident to model and design changes that constantly confront a builder of motor cars. Once quality standards are established for vendor parts, maintaining these standards then becomes a routine job of quality control.

Special Setups Mass-Produce Accurate Holes

It's one thing to drill accurate holes in a small housing when you're only making a few; but quite another story when the prints call for ±0.0005 on several holes in about 500 pieces per hour.

■ The diecast aluminum - alloy housing is one of the more critical parts of an electric window regulator for automobiles. Castings are made fairly close to size but require some machining, chiefly drilling and sizing of holes for bearings. And since they support as well as enclose a worm and worm gear, it takes real ingenuity to mass-produce housings inexpensively and still maintain close tolerances.

Here's where special setups come into play. By tailoring fixtures, machines and techniques to each step, Huppower Div. of Hupp Corp., Detroit, is turning out staggering quantities for their window regulator — and holding accuracy within ±0.0005 in. in the bargain.

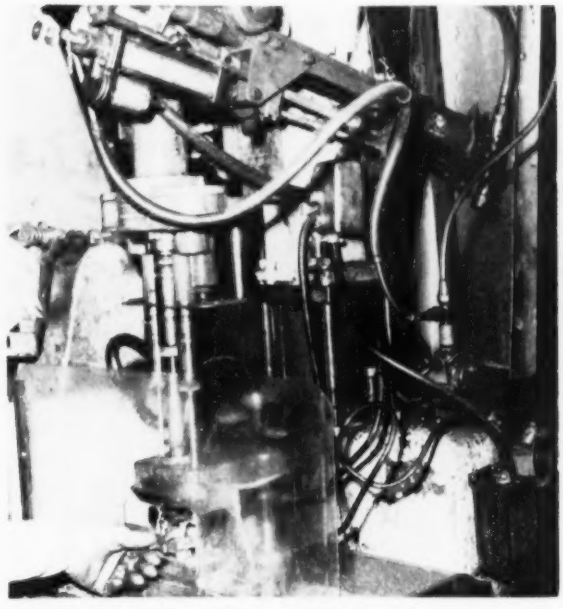
Initial machining is done on a drill press equipped with a Wisconsin geared head that operates three reamers. Two of these ream two cored screw holes at 0.311 to 0.312 in. diam on opposite sides of the casting; the other sizes a central cored hole for the worm gear shaft bearing race, holding it within limits of 0.9985 and 0.9995 in. diam.

First, the casting is air-clamped in a holding fixture. Next, a Bellows air feed lowers the head, and retracts the tools after the end-cutting reamers make their cuts. Then the workpiece is unclamped and removed by hand.

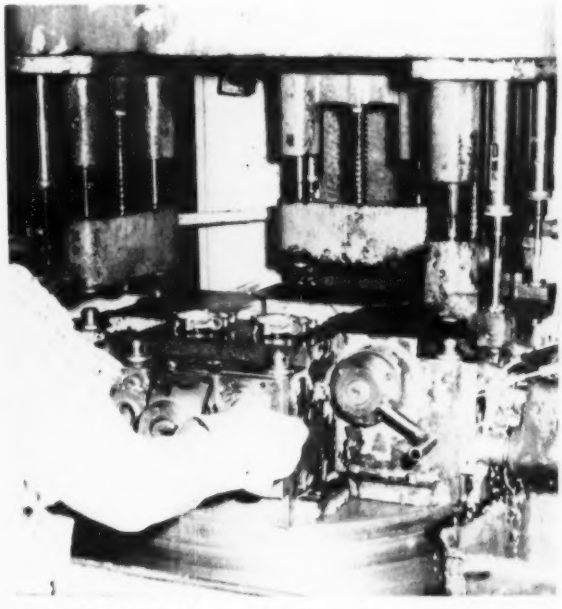
Two At a Time—From here the castings are loaded, two at a time, in a Rehnberg-Jacobson machine. The pieces are positioned by means of the previously reamed holes and clamped by a hand lever.

In this fixture, the hole for the worm gear shaft bearing is drilled and reamed in each piece by tools that feed automatically and retract. Both parts are then reloaded in a horizontal fixture and the central worm gear race holes are rereamed, holding ±0.0005 in. on diam and ±0.001 in. on hole location. About 500 castings an hour are machined in these setups.

On some castings, the worm bushing hole must be drilled at a special angle. This is done on a double-end Ex-Cell-O machine. Two fixtures—one for drilling and the other for reaming—are set at the special angle. Then each casting is successively hand-clamped in each of two fixtures.



THREE-IN-ONE: Drillpress equipped with geared head and automatic air feed quickly and accurately reams three holes in one pass.



PRECISE WORK: A Rehnberg-Jacobson unit machines close-tolerance holes in two parts at a time, using dual fixtures in two planes.

Sight Gage Checks Gundrill Cutting Edges

Sharp, accurate edges do the best cutting job.

But how to maintain them, especially on gundrills and tube reamers?

Here's how to do it with inexpensive checking equipment.

▪ Users of gundrills, or "deep hole" drills face a problem in sharpening.

Some plants have to use costly or elaborate instruments such as comparators and microscopes to check sharpening accuracy. In other plants, partly worn drills are discarded because tool room personnel do not want to go through elaborate, expensive procedures to check sharpening.

Answer In Sight Gage—To overcome this problem, the engineers at Eldorado Tool & Mfg. Corp., Milford, Conn., developed a simple sight gage for a quick accurate check of the sharpening operation. The gage is so inexpensive and easy to make that Eldorado offers this information as a service rather than manufacturing the gage for sale.

The sight gage makes gundrills about the easiest tools in the shop to sharpen and check. There are but two cutting edges, the inner and the outer nose angles that require sharpening.

These can be sharpened several times before a complete nose regrind is necessary. Oftentimes the regrinding of the outer angle by a few thousandths is the only requirement.

Nose grind styles determine the form of chip for easiest removal by the coolant. Fig. 1 shows suggested angles.

How To Make—A gage for each drill diameter is required. The procedure is as follows:

1. Take a piece of screw stock at least four drill diameters long.

2. Gundrill the stock 3½ diam deep, or twist drill and bore to gundrill size 3 diam deep on a lathe. Next, put the gundrill in the tailstock, carefully feeding the drill

SHOP-MADE UNIT: A few simple steps make a gage that replaces costly precision equipment.

EASY CHECKING: If light shows between drill tip and gage impression, sharpening is required.

(with your desired grind on it) in just enough to bottom the hole, forming the profile of the gundrill. Be sure to use light feed and ample cutting fluid.

3. Mill the blind end to centerline of the hole in front. Then mill away enough stock on the back side to leave 1/16 to 1/8 in. thickness of the sight-blade. Fig. 2 shows the depth of location of this step for the maximum tolerance of the oil clearance shoulder. To position the gundrill in the gage correctly, hold the flat surface of the drill flush with the front of the gage. Looking from the front you have a sight gage for both angles and from the rear a gage for checking clearance and the inner angle.

4. Remove burrs and inscribe markings on front, rear, and minimum tolerance for oil clearance shoulder.

How To Use—With the sight gage made, there are only four steps to resharpening a gundrill or tube reamer.

1. Correct oil clearance step to dimensions "E" (Fig. 2) with minimum of 0.030-in. tolerance.

2. Grind inner angle. Using rear view of gage, check angle through opening.

3. Grind outer angle. Using front view of gage, check for angle accuracy and location by holding the drill flush with front surface of gage.

4. Chamfer 1/64x45° from top of shoulder to bottom of secondary clearance of outer angle.

Unless the gundrills are very large, no secondary clearance is needed for the inner angle. The primary clearance land should be very small, not more than 1/64th on small drills. It's simply to show that the correct clearance has been ground on the drill.

The above parts are the only parts of a gundrill that should be touched up. Touching up any other edge or surface will ruin the tool.

The determining factor for resharpening is the width of the wear-land. Amounts to be ground off depend on the damage to be removed at the outer corner of the outer angle.

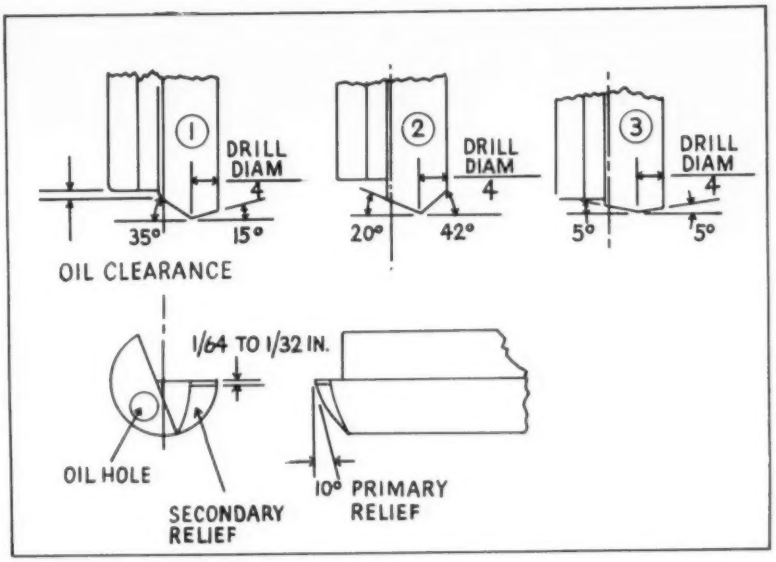
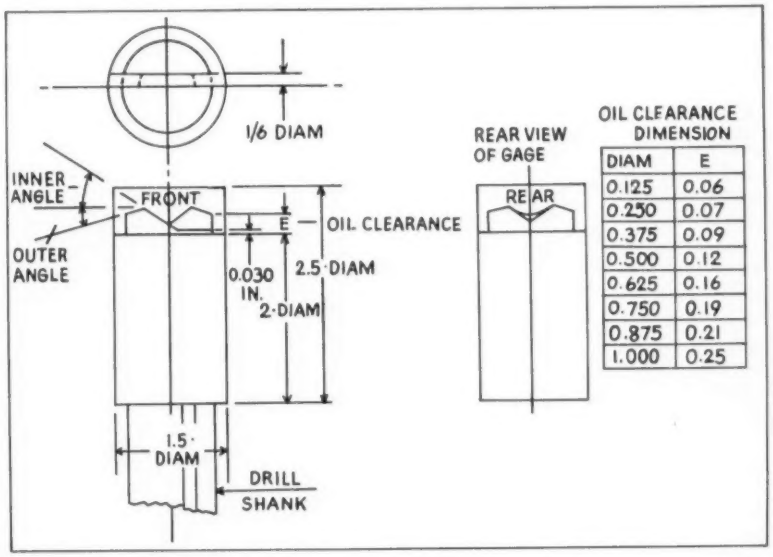


FIG. 1: Use nose style 1 and 2 for free-cutting materials and for hardness RC 22 and harder nose style 3 for all others.



OIL CLEARANCE DIMENSION

DIAM	E
0.125	0.06
0.250	0.07
0.375	0.09
0.500	0.12
0.625	0.16
0.750	0.19
0.875	0.21
1.000	0.25

FIG. 2: Diameter of drill determines size of gage. Table shows oil clearance dimensions for differing diameter of tools.

Care Boosts Tool Life—Gundrills can be sharpened until there is practically no carbide left or in the case of inserted carbide tips, until the radius in back of the cutter meets the centerline of the tool. At 0.005 in. per sharpening, a 1-in. (useable) length of tool amounts to approximately 200 sharpenings. Care taken in sharpening lengthens tool life and reduces expense of diamond wheels.

Diamond wheels of 180 to 320 grit are the most efficient. Peripheral wheels are easier to keep sharp and to dress than face wheels.

In proper use and with good equipment, gundrills are the easiest tools in the shop to resharpen. With only two cutting edges and their clearances, it pays to have a simple portable gage for checking sharpening accuracy.

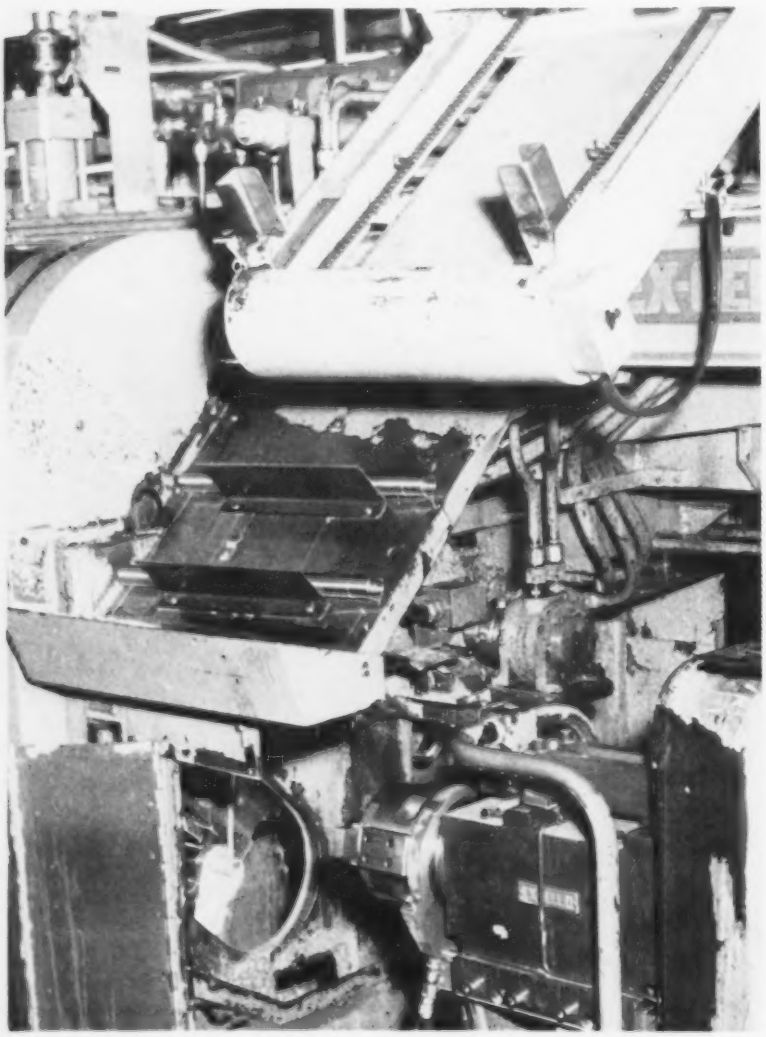
One Machine Does Work Of Four In Half The Time

Here's a familiar advance in machining techniques. It's in combining a series of operations. But there's more to it than that.

The real efficiency comes in machining both ends of the product in the same cycle. It cuts out intermediate handling to make the process continuous.

▪ One operator in a single shift machines as many drive shafts as seven men can turn out on three turret lathes and a single-spindle machine in two shifts. The unit shown below makes it possible.

It's a new double-end machine built by Ex-Cell-O Corp., Detroit, for Whirlpool Corp., St. Joseph, Mich. The new unit turns out tubular basket drive shafts for home laundry washing machines.



MACHINES BOTH ENDS: Conveyor, top center, feeds magazine. Finished shafts, machined at both ends, are ejected below conveyor.

High Output—The new machine with 31 carbide tools features four Ex-Cell-O heads at each end and a central indexing drum fixture. Auxiliary equipment for loading and unloading handles the output of 240 shafts an hour.

The machine makes both internal and external cuts at each end of the shaft. Close tolerances are maintained consistently. When tools have to be reset, an indicator is used and downtime is short.

The entire operation is automatic, including loading and unloading of the fixture. The operator only must see that the magazine is supplied with shafts.

Loading is done on a short double-chain conveyor that discharges into the magazine. Shafts unload onto inclined cleats below the conveyor.

Four Stations — A mechanical loader pushes two shafts at a time from the magazine into the indexing drum against positive stops. Mechanical locking occurs and the pair of shafts indexes through the four successive machining stations.

The following operations, which are the same on both ends (except for No. 6 below) are performed in succession: 1. Rough bore. 2. Finish bore, holding ±0.0015-in. limits. 3. Face end. 4. Turn OD-step and form ring groove. 5. Counterbore 5/32-in. deep, producing 0.938-in. dimension. 6. Chamfer OD at one end. 7. Unload.

A constant flow of soluble oil cools all cutting points and washes chips into a sump. Aside from keeping the machine supplied with shafts and removing those machined, the operator need only check occasional pieces to insure that dimensions are within limits.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 115.

Machining Aluminum

Three informative aids for screw machine operators, shop management, and metals buyers are now available. They include a guide for machine feeds and speeds, a quantity-weight slide rule calculator, and a manual of basic information on machining aluminum. (Kaiser Aluminum & Chemical Sales, Inc.)

For free copy circle No. 1 on postcard, p. 115

Switches

Specifications on rotary, slide and lever switches appear in a 35-page catalog. It lists a complete line of switches for handling power from 1-kw to a microwatt. (Centralab Div., Globe-Union, Inc.)

For free copy circle No. 2 on postcard, p. 115

Filter Systems

Centralized filtration systems are discussed in a 4-page brochure. (Industrial Filtration Div., U. S. Hoffman Machinery Corp.)

For free copy circle No. 3 on postcard, p. 115

Heavy-duty Clamps

Heavy-duty clamps are covered in descriptive literature. Designed and built for tough holding jobs, hand clamps come in four models with either a solid bar or channel bar of cold-rolled steel with clamping pressures of either 200 or 400 lb. Two new heavy-duty air (or oil) operated models have the solid-bar features for demanding applications of automation. (Lapeer Mfg. Co.)

For free copy circle No. 4 on postcard, p. 115

Automatic Loader

Automatic loaders for heat-treat furnaces, plating lines and continuous tumbling setups are reviewed in a folder. The loader delivers 500 to 5000 lb of small stampings, screw machine parts, or even castings and forgings up to 14 per hour. (Michigan Crane & Conveyor Co.)

For free copy circle No. 5 on postcard, p. 115

Special Tools

Highlighted by many special tools, a new bulletin describes numerous work-holding devices. Featured are: standard and special chuck jaws, expanding mandrels, gear hobbing arbors, special collets, milling machine adapters, cutoff blades and other tools. (Sutton Tool Co.)

For free copy circle No. 6 on postcard, p. 115

Valves, Regulators

Control valves and regulators are covered in a bulletin. The 8-page booklet gives construction details and operating characteristics of air-operated valves. (Conoflow Corp.)

For free copy circle No. 7 on postcard, p. 115

Value Analysis

"Value Analysis," a modern trend in purchasing, is applied to

malleable iron castings in a new brochure. It's for use by cost reduction and value analysis committees and purchasing departments. Advantages to be gained when a malleable foundry engineer is consulted at the drawing board stage are illustrated. (The Malleable Founders' Society.)

For free copy circle No. 8 on postcard, p. 115

Machine Tool

A 28-page catalog details a new portable precision machining tool. It includes information on how to use the basic unit and seven attachments for milling, boring, shaping, slotting, grinding, drilling and dozens of other related operations. (The Dumore Co.)

For free copy circle No. 9 on postcard, p. 115

Resolver

A data-sheet describes a new, high accuracy size 15 resolver. This unit features tuned impedance of 10,000 ohms, permitting operation over a wide voltage range. (Norden-Ketay Corp.)

For free copy circle No. 10 on postcard, p. 115

Heating Units

Gas-fired overhead heating units are described in a "photo album." The 16-page booklet contains photographs of heaters installed in a wide variety of commercial and industrial plants. (Thermobloc Div., Prat-Daniel Corp.)

For free copy circle No. 11 on postcard, p. 115

Valves

Bronze and iron body valves are outlined in a booklet. The 136-page catalog includes helpful technical data for the initial design of piping layouts. (The Fairbanks Co.)

For free copy circle No. 12 on postcard, p. 115

Phosphating

Phosphating of parts too large for tank or spray machine application is the subject of a service report. It tells how certain solutions, applied through solution-lifting

NEW OAKITE CLEANERS GIVE YOU MORE FOR YOUR PAINT-PREPARATION DOLLAR

Here are 4 ways to end pre-paint metal-cleaning troubles

Does your trouble chart show that you need better cleaners, strippers or surface conditioners?

- ☐ Cleaning solution foams excessively in spray washing machine. See 1 below.
- ☐ Streaky discolorations or powdery residues cling to surface of steel parts being stripped for repainting. See 2.
- ☐ Zinc phosphating process too difficult to control . . . Iron phosphating process doesn't show good results in salt spray tests. See 3.
- ☐ Too many operations—cleaning, pickling, neutralizing, etc.—are needed to prepare steel that does not require phosphating before painting. See 4.

Here are brief descriptions of new Oakite materials designed to end these particular troubles:

1. For a spray washing solution that does not foam at high pressure, try Oakite Composition No. 161. Does not attack aluminum.
2. For stripping pigmented paint, phosphate coatings and undercoat rust *in one operation*, try Oakite Rustripper.
3. For a zinc phosphating process that is truly easy to control, try new Oakite CrysCoat SW . . . For salt spray results far beyond the capacity of ordinary phosphating processes, try new Oakite CrysCoat No. 89.
4. For *one-operation* removal of rust, heat scale, welding residues and light soil together with good preparation for painting, try Oakite Compound No. 131. Inhibited against attack on steel.

FREE Check the coupon and we will send you free booklets or bulletins with full information on new Oakite cleaners.

OAKITE PRODUCTS, INC.
30H Rector Street, New York 6, N. Y.

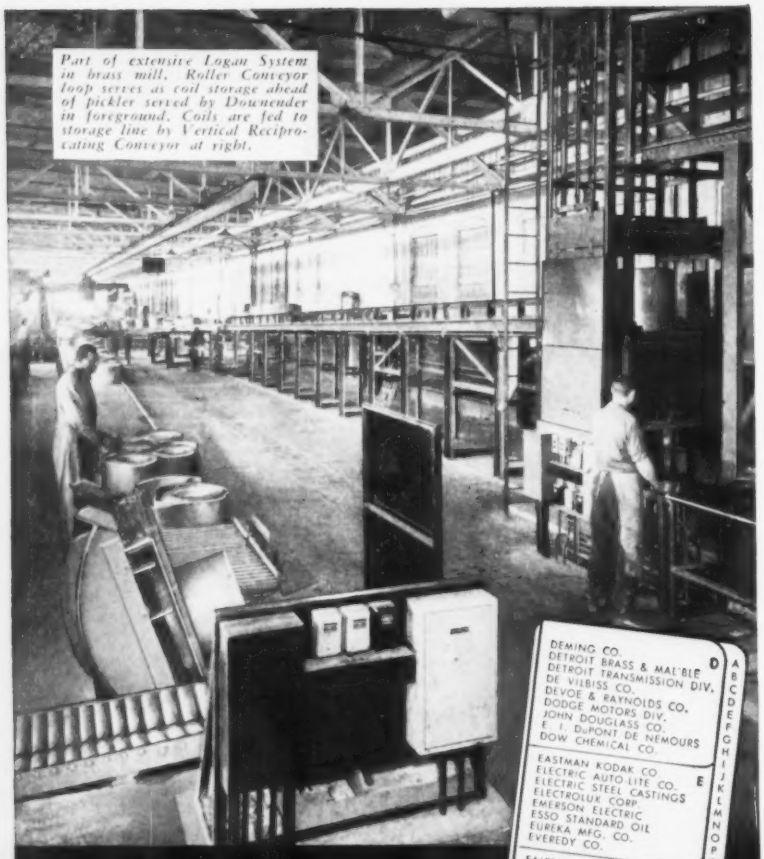
Send me free booklets or bulletins giving complete information on the new Oakite materials checked below:

- ☐ Oakite Composition No. 161
- ☐ Oakite Rustripper
- ☐ Oakite CrysCoat SW
- ☐ Oakite CrysCoat No. 89
- ☐ Oakite Compound No. 131

NAME _____

COMPANY _____

ADDRESS _____


Part of extensive Logan System in brass mill. Roller Conveyor loop serves as coil storage ahead of pickler served by Downender in foreground. Coils are fed to storage line by Vertical Reciprocating Conveyor at right.
D
DEMING CO.
DETROIT BRASS & MALLEBLE
DETROIT TRANSMISSION DIV.
DE VILBISS CO.
DEVOE & RAYNOLDS CO.
DODGE MOTORS DIV.
JOHN DOUGLASS CO.
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EASTMAN KODAK CO.
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ELECTROLUX CORP.
EMERSON ELECTRIC
ESSO STANDARD OIL
EUREKA MFG. CO.
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FISHER BODY CORP.
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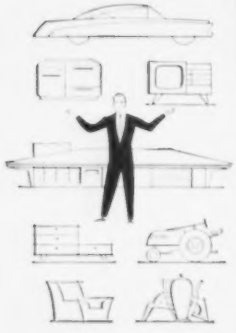


"Staying out in front" often is just as difficult as getting there in the first place. That is one of the reasons why America's leading industries depend on Logan Conveyors as an integral part of their productive processes. Speeding output, enlarging capacity, conserving manpower, and decreasing labor turnover are major Logan functions which you, too, can use to advantage. Write for nearest engineer or for further information.

LOGAN CO., 545 CABEL ST., LOUISVILLE 6, KY.

Logan Conveyors

FREE LITERATURE

steam guns, simultaneously clean and coat metal with a fine phosphate film. This protects against under-surface corrosion on painted surfaces. (Oakite Products Inc.)

For free copy circle No. 13 on postcard, p. 115

Strip Stock

Precision strip stock is offered in a 12-page product directory. It lists beryllium copper, chromium copper, phosphor bronze, nickel silver, brass, stainless and nickel-iron strip rolled to close tolerances and thin gauges. Tabular material covers availability, mill limits, applicable specifications, and complete property data. (Penn Precision Products, Inc.)

For free copy circle No. 14 on postcard, p. 115

Titanium Racks

How titanium gives anodizing racks new life is told in a 4-page brochure. It describes the superior corrosion resistance of titanium in anodizing operations. (Johnston & Funk Titanium Corp.)

For free copy circle No. 15 on postcard, p. 115

Blast Cleaner

High-speed, airless blast cleaning machines are covered in a catalog. It describes a multi-table unit, equipped with either eight 24¼, seven 30¼, or five 37-in. diam rubber covered worktables. The setup can be used either for cleaning or peening operations. (Wheelabrator Corp.)

For free copy circle No. 16 on postcard, p. 115

Quality Controls

Quality control equipment for supervision, inspection and production operations is described in a 4-page bulletin. It covers standard sizes and prices of free-standing portable inspection cabinet assemblies; eye-level quality control chart stands and chart holders; self-stacking steel storage racks and ingenious portable rotating storage drums for line storage, conveyor carrier or in-process operations. (Visi-trol Engineering Co.)

For free copy circle No. 17 on postcard, p. 115

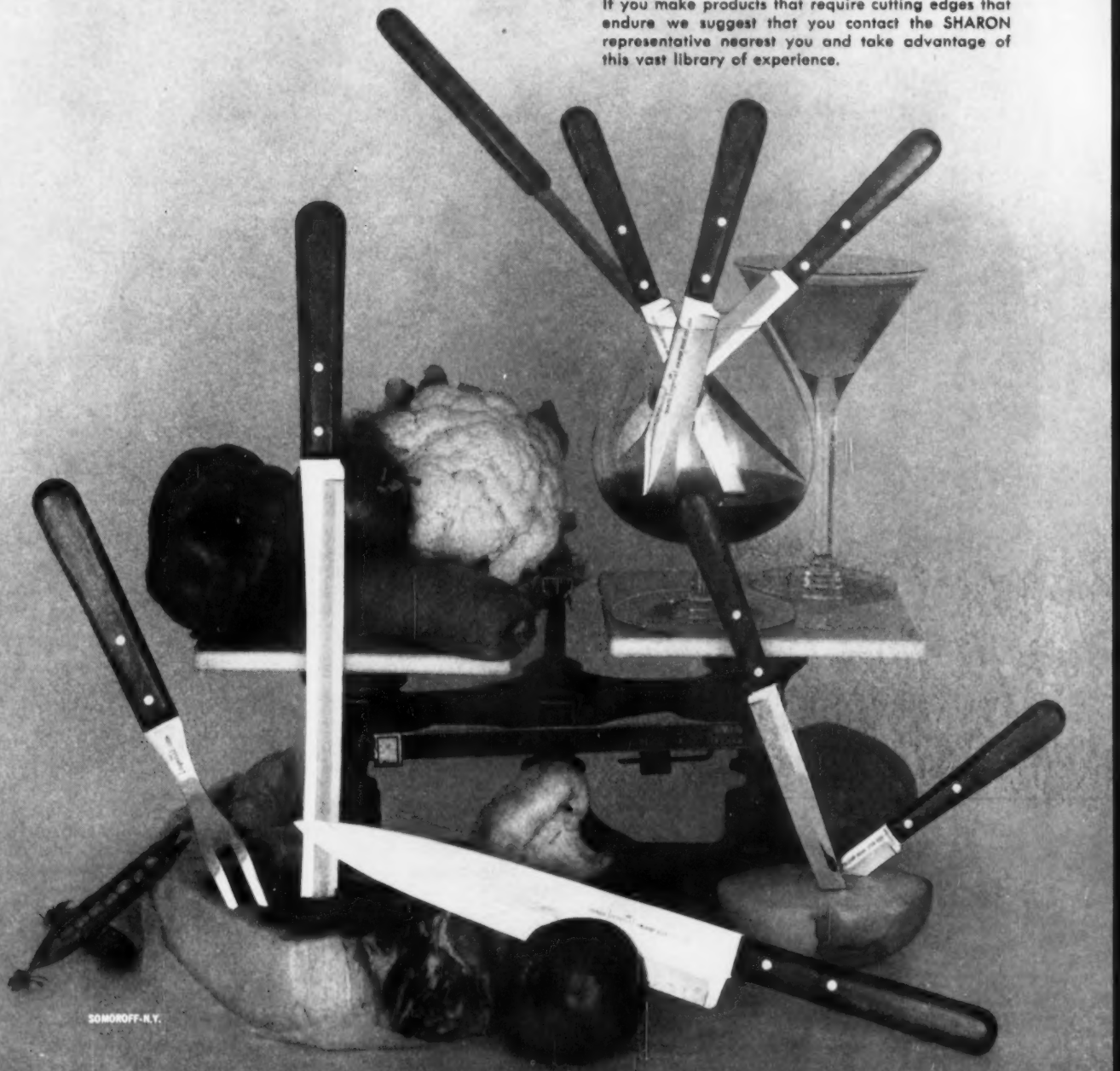
IN CUTLERY, TOO,

Sharonsteel Quality STANDS OUT

• Cutlery manufacturers know well the name SHARON, for in the past five decades SHARON has excelled in the production of steels used in the manufacture of implements for cutting.

From exquisite carving blades to rugged chain saw teeth, razor sharp scalpels, agricultural and earth moving equipment SHARON provides the edge holding and abrasion resistant steels manufacturers can trust.

If you make products that require cutting edges that endure we suggest that you contact the SHARON representative nearest you and take advantage of this vast library of experience.



SHARONSTEEL *For 56 Years a Quality Name in Steel*

174

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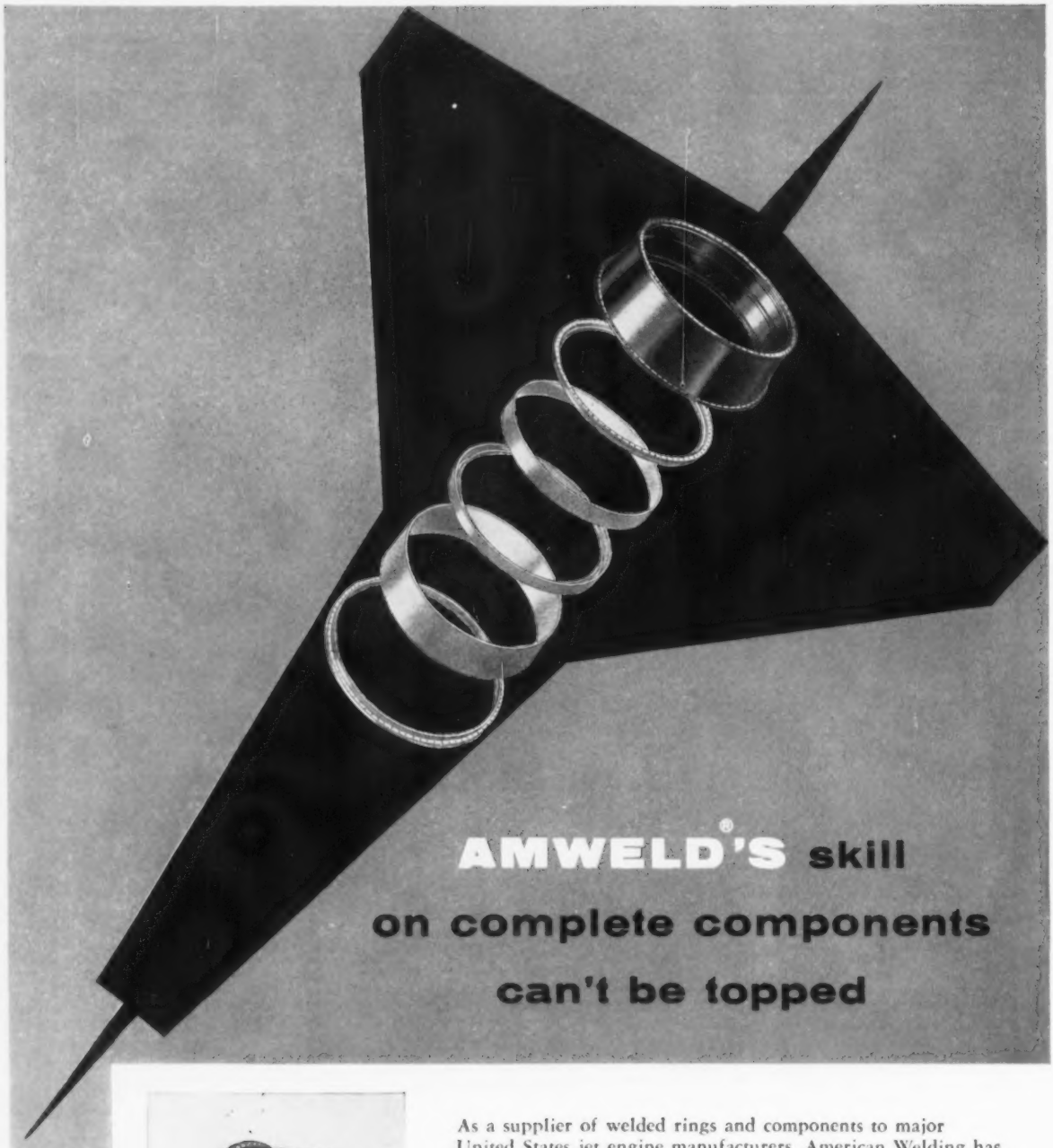
CHICAGO, CINCINNATI, CLEVELAND, DAYTON, DETROIT, GRAND RAPIDS, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, ROCHESTER, SAN FRANCISCO, SHARON, SEATTLE, MONTREAL, TORONTO



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As a supplier of welded rings and components to major United States jet engine manufacturers, American Welding has proven its skill as part of an industry where cost and precision are vital factors. As the missile and rocket programs grow from the experimental to the production stage, Amweld's experience and skill can play a part in these essential programs.

If you have a problem that can be solved by a rolled and welded ring or component, or any welded fabrication, contact American Welding's Industrial Products Division. Their skill, experience, and engineering are at your service.

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The World's Leading Manufacturer of Welded Rings

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Proving Rings

Accuracy in weighing and force measurement systems is discussed in a 12-page brochure. It explains proving rings and their use. (Morehouse Machine Co.)

For free copy circle No. 18 on postcard

Heat Treating

Production heat treating of gears and parts in a continuous gas carburizer with controlled atmosphere equipment is featured in a publication. (Surface Combustion Corp.)

For free copy circle No. 19 on postcard

Expanders

Mechanical and hydraulic powered expanders appear in a new bulletin. It describes expanding and discusses expander machine selection, operation and tooling. (For free copy write on company letterhead for bulletin 557 to Grotnes Machine Works, Inc., 5454 North Wolcott Ave., Chicago 40, Ill.)

Pressure Regulators

Bronze pressure regulators appear in a 26-page folder. It describes regulators for pressure control of air or steam at up to 250 lb and 450°F. (Crane Co.)

For free copy circle No. 20 on postcard

Plant Sites

If you're going to locate a new plant, maybe a new state promotional folder will come in handy. It gives various economic facts about the state, tells why it's a good place to open new industry. Of particular interest is a forecast of new markets opening in the area, along with a predicted 117-pct boost in population. This compares with the rest of the nation's 42-pct. (Arizona Development Board.)

For free copy circle No. 21 on postcard

Diamond Wheels

An identification code for diamond wheel shapes has been prepared by the American Standards Assn. Printed versions of this are now available. (For free copy, write on company letterhead to the Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15, Ohio.)

Silver Flux

Literature now available tells of a silver alloy flux for aluminum bronze, beryllium copper, stainless steel, brass, inconel, nickel and a number of other metals. This flux melts at 1160°F. (Krembs & Co.)

For free copy circle No. 22 on postcard

Electric Heaters

Electric heating units are the subjects of a 4-page bulletin. Designed for many industrial applications, the cartridge heating units produce up to five times more heat than some other standard cartridge heating units. (Watlow Electric Mfg. Co.)

For free copy circle No. 23 on postcard

Steel Tubing

Just released, a 12-page booklet depicts seamless and electric resistance steel tube's uses in materials handling equipment. (Ohio Seamless Tube Div., Copperweld Steel Co.)

For free copy circle No. 24 on postcard

Contract Engineering

Forward-looking is important. With this as its theme, a contract engineering firm's brochure explains how future profits can de-

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **10/3/57**

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FREE LITERATURE

pend on advanced and creative engineering, especially in designing. To help firms look forward, it describes services available for machine designing and fabricating, equipment layout, training of personnel, and more. (The Teller Co.)

For free copy circle No. 25 on postcard

Heat-resist Castings

Marking the completion of a 10-year research project is a set of data sheets. These give up-to-date property information on heat resistant cast high alloys. (Alloy Casting Institute.)

For free copy circle No. 26 on postcard

Carbide Tools

Carbide tools are dealt with in a 36-page booklet. It covers carbide tipped drills, reamers, end mills, countersinks, milling cutters, counterbores and centers. (Super Tool Co.)

For free copy circle No. 27 on postcard

Barrel Processing

Automatic barrel processing is featured in a 14-page brochure. It covers zinc, nickel, copper, tin and cadmium plating, cleaning, washing, phosphating, stripping and other similar immersion applications. (Frederic B. Stevens, Inc.)

For free copy circle No. 28 on postcard

Magnesium Scribers

Lightweight magnesium scribers now available weigh only 12 oz. per ft. They come in six standard sizes to 48-in. long. A company publication describes them. (Challenge Machinery Co.)

For free copy circle No. 29 on postcard

Cutting Tools

Cutting tools and equipment available from one company is featured in a catalog. It covers: adjustable boring and reaming tools, bottoming tools, trepanning tools, gun drills, spade and core drills, adjustable boregages, grinding arbors and special tools. (For free copy, write on company letterhead to Madison Industries Inc., Muskegon, Mich.)

Magnetic Tape

Magnetic tapes for instrumentation recording are the subject of an 8-page booklet. (Minnesota Mining and Mfg. Co.)

For free copy circle No. 31 on postcard

Cap Screws

An 8-page guide for design and assembly of one maker's cap screws has just been published. (Strong, Carlisle and Hammond)

For free copy circle No. 32 on postcard

Strip Fasteners

Tandem strip fasteners are listed in a catalog. It involves attachments employing two or more screws. (For free copy write on company letterhead to the Prestole Corp., 1345 Miami St., Toledo 5, Ohio.)

Aluminum Conveyor

Production of a new aluminum 1.75-in. roller conveyor is announced in a bulletin. (The Rapids-Standard Co., Inc.)

For free copy circle No. 33 on postcard

Voltage Regulator

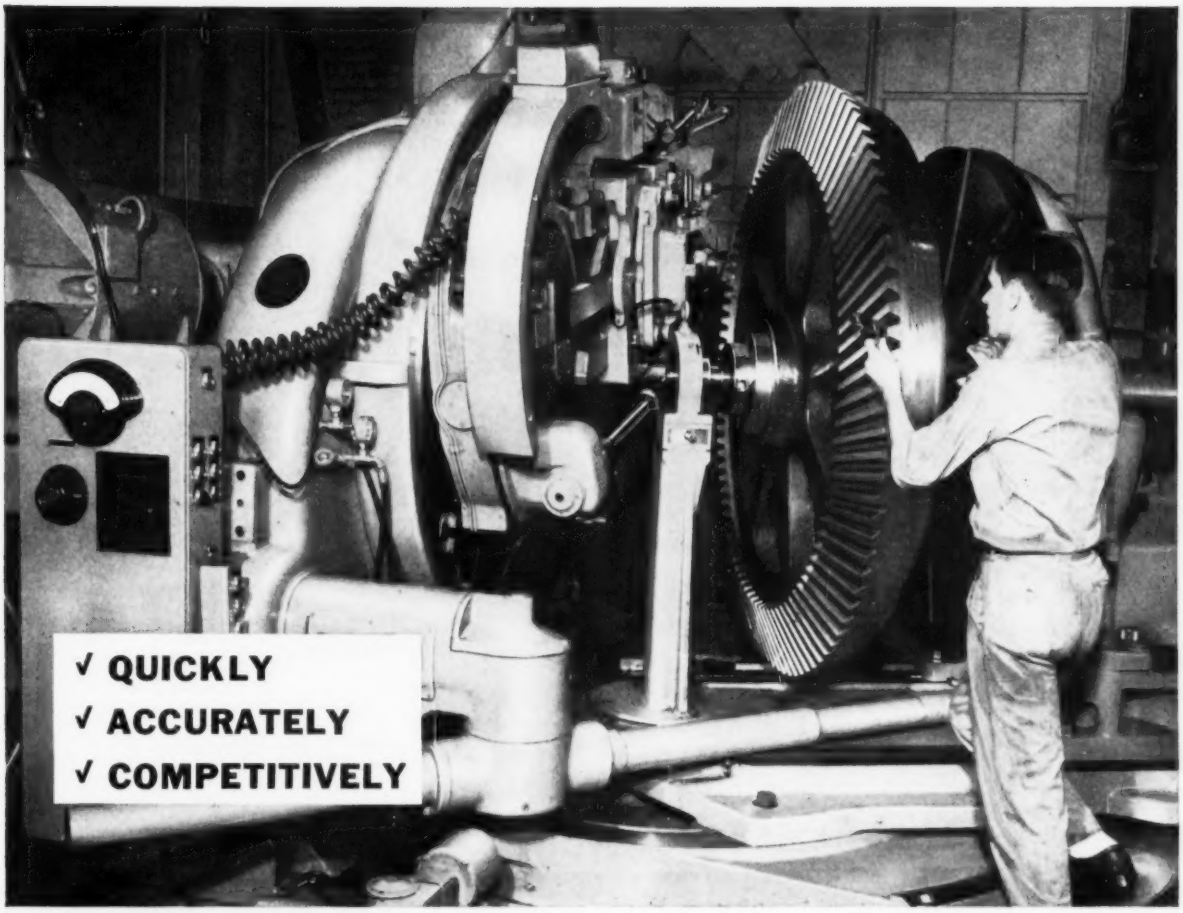
Corona type voltage regulators are introduced in a bulletin. It covers both glass and metal construction types. (Victoreen Instrument Co.)

For free copy circle No. 34 on postcard

Locking Nuts

New self-locking nuts available from one firm are described in a catalog as 49 pct lighter than their standard counterparts. (Standard Pressed Steel Co.)

For free copy circle No. 35 on postcard



phillie gear...spiral bevel gears to 72" diameter

Phillie Gear's new #70 Bevel Gear Generator will cut the widest possible selection of Spiral-Bevel, Zerol and Hypoid Gears, in diameters up to 72", and face widths to 10". Even in these massive sizes, accuracy of tooth form and optimum load carrying characteristics of pinion and gear are positively assured.

Philadelphia Spiral Bevel Gearing is hardened to produce a tool-like surface, yet, retain a resilient core to withstand high shock loading. Finally, every gear set is lapped on special test machines to ensure best possible tooth bearing.

Philadelphia Spiral Bevel Gears—in any quantity, size, and ratio are quickly and correctly manufactured to your specifications.

The installation of this modern gear generator, is another step forward in making Phillie Gear one of the World's best equipped, largest and most progressive gear manufacturing plants. Your inquiries are cordially invited.

Send for the Philadelphia Gear Design Manual G-655—kindly use your business letterhead.

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Automatic Controls Reduce Power Demand and Costs

Sometimes electric bills bite into profits too much. To cut power costs down, one steelmaker adopted a new load control setup.

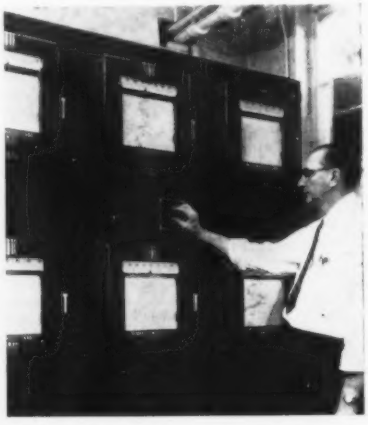
This system keeps power demand down; yet it does not reduce steel production.

▪ Automatic electrical load control on electric furnaces can keep power bills down. This is the conclusion of a large steelmaker that has adopted an efficient system of controls.

A saving of $4750 in demand charges during the first month's operation of a new Leeds & Northrup automatic load control system has been reported by Allegheny Ludlum Steel Corp. During this same month, the steelmaker consumed 400,000 kw hours more energy. Yet its net bill was $3150 less than the previous month. The 400,000 kw hours could be called an extra "no charge" bonus. Currently the company estimates savings at 20,000 kw per month.

Demand Charges—For electric melting furnaces, the firm bought electrical power that peaked to well over 100 megawatts, if unregulated. The total power bill consisted of a 15-minute demand charge and an energy charge.

Analysis of the company's load control curve by a Leeds & Northrup field engineer showed that



Strip charts keep a permanent record of load measurements.

substantial savings should result if demand was reduced. And this, he estimated, could be done without a reduction of steel production.

Selective Control—A load control system was installed to regulate the 15-minute demand, rather than

ARMSTRONG

SET-UP and HOLD-DOWN TOOLS

ARMSTRONG Set-up and Hold-down Tools reduce setting-up time—keep men and machines producing. Designed for use on planers, drill presses, milling machines, etc., they hold work securely and rigidly, and thereby reduce spoilage and prevent costly accidents. Your local Armstrong Distributor carries ARMSTRONG Set-up and Hold-down Tools in stock in sizes for every operation. Stop haphazard setting-up methods. Provide each of your machines with a full complement of ARMSTRONG Set-up and Hold-down Tools.

Write for Circular

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5209 W. Armstrong Ave.

Chicago 30, U.S.A.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 115. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

the instantaneous kw, as in a normal control application. This control integrates the kw hours excess over a desired demand period. Then it automatically determines the required load reduction. If the load trend indicates that the schedule will be exceeded, the regulator resets controls on the electric furnaces, reducing their load.

The control automatically selects the furnace or furnaces which are melting (creating excess demand) without disturbing the furnace under refining operation (contributing only slightly to excess demand.)

Setup Pays Off — The control now regulates demand at about 70,000 kw. On a monthly average, peak demands fall within 1500 kw of this desired value.

In one month the five peak demands were within 1000 kw of each other, resulting in a considerable saving in demand charges plus maximum consumption of kw hours.

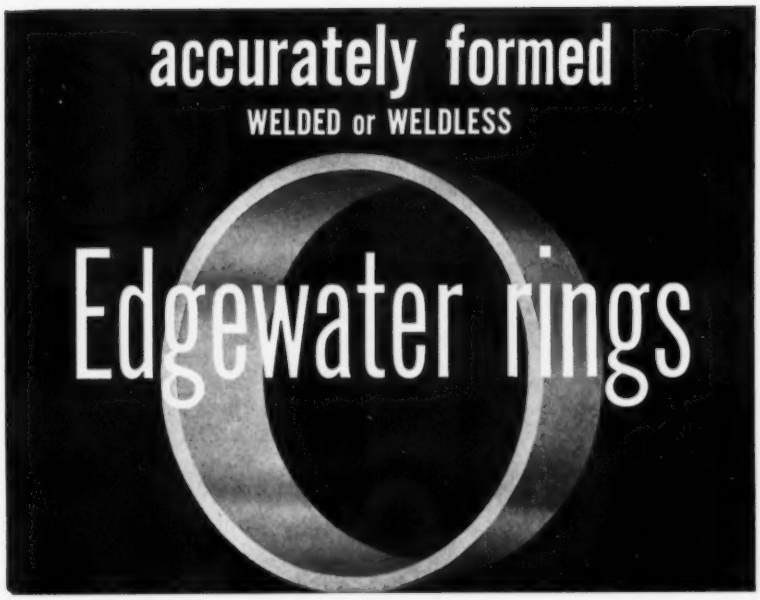
Surveys Computers

Prospective users of electronic digital computers may find aid in the choice of proper equipment in a new U. S. Army report. The study, covering engineering and programming characteristics of 103 commercially available systems, comes in book form (439 pp). It's available from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. The book's catalog number is PB 111996-R.

Discuss Atom Metals

The elements of nuclear reactor metallurgy will be discussed at a coming series of lectures. To be held in five sessions beginning Oct. 9 at New York Community College, Brooklyn, the talks are sponsored by the American Society for Metals, New York Chapter.

Subjects to be covered include: reactor and general metallurgical considerations, solid fuel materials



save critical materials . . .

reduce costly machining . . .

meet highest quality standards

Your most critical specifications can be met by Edgewater Steel Rings—welded or weldless as required by the service. Formed accurately by modern methods, they are close to finish size as rolled. Weldless rings are rolled from solid steel blocks, in diameters from 5 to 145 inches. Welded rings up to 48 inches in diameter are formed from bars extruded or rolled to shape. Both types can be made in a great variety of sizes and cross-section shapes, as shown below. Being accurate in size and cross-section, Edgewater Rings save costly material and machining time.

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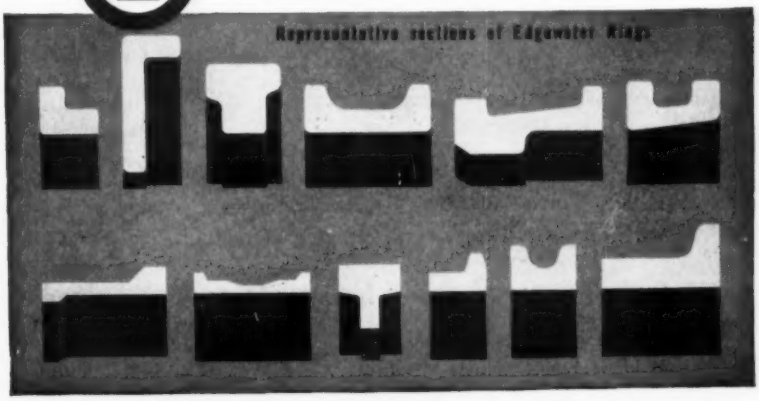
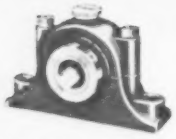


DODGE PRODUCTS you should know



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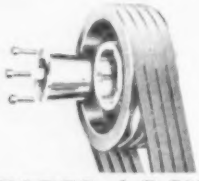
America's Quality Pillow Blocks!



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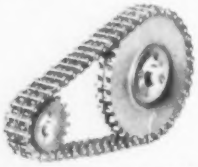
SHEAVES
Easy on — easy off! Mount flush!



TAPER-LOCK
SPROCKETS
No reboring — no waiting!

•

Write for Bulletins!

- Roller Bearings. Load ratings, dimensions, etc. Bulletin A-638.
- Taper-Lock Sheaves. Drive tables and technical data. Bulletin A-661.
- Taper-Lock Sprocket and Dodge Roller Chain data. Bulletin A-644.

DODGE MANUFACTURING CORPORATION
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of Mishawaka, Ind.

TECHNICAL BRIEFS

metallurgy, reactor structural materials, applications and properties of liquid-metal fuel material, and the problems of radiation damage in metals.

Chemical Milling Tank Tapers 55-ft Parts

Chemical milling needn't be limited by size of parts processed. Proof of this is a new installation that tapers 55-ft aircraft sections.

Now in operation at U. S. Chemical Milling Corp., Manhattan Beach, Calif., the setup's key unit is a large vertical tapering tank. It extends 60 ft underground.

Takes Long Items — Chemical milling, the controlled removal of metal by a chemical etchant, works on both large and small parts. Of course, this 60-ft tank handles large components; some are 55-ft long and 11-ft in diameter.

Parts are tapered by controlling the rate of immersion into the solution.

Making The Tank—Over 750 cu yds of earth were removed during construction of the tank. Eleven corrosion-resistant rings, 6 ft high and 12 ft in diameter placed into the ground form the tank shell. The bottom four rings are fabricated of $^3/_8$ in. Cor-Ten steel while the remainder of the rings are $^5/_{16}$ in. thick.

The exterior of the tank was coated with a preservative before it was fabricated. However additional protection in the form of an anodic system prevents any external electrochemical reactions from eating away the tank shell.

Provides Protection—Four 25-lb magnesium bars are attached 90° apart on the exterior of the tank. These bars are connected electrically and grounded to provide the necessary protection. In time, electrolysis will eat away the bars. But it will leave the surface of the tank undamaged.

No protection is needed for the interior of the tank; the chemical solution used as etchant for aluminum acts as a preservative for steel.

Uses Precise Controls—Since the taper angle is controlled by the rate of immersion, a precise mechanical control system must be used to immerse the part into the solution at a uniform and predetermined rate. A rapid immersion produces a small taper angle and a slow rate of immersion produces a large taper angle.

Extrusions and other parts are lowered into the tank with an overhead hoist. A wide range of immersion speeds are needed to produce all possible taper angles. Since the requirements could not be met by existing electrical and pneumatic systems, company engineers designed a special hydraulic drive system that utilizes a variable displacement hydraulic motor to power the overhead hoist. The result is a continuous range of immersion speeds varying from 0 to 120 fpm.

Tiny Award Coming

If you know someone who tackles smallness in a big way, maybe he's eligible for an award. The award, which will recognize the greatest contribution by an individual or firm to the advancement of miniaturization, will be made annually.

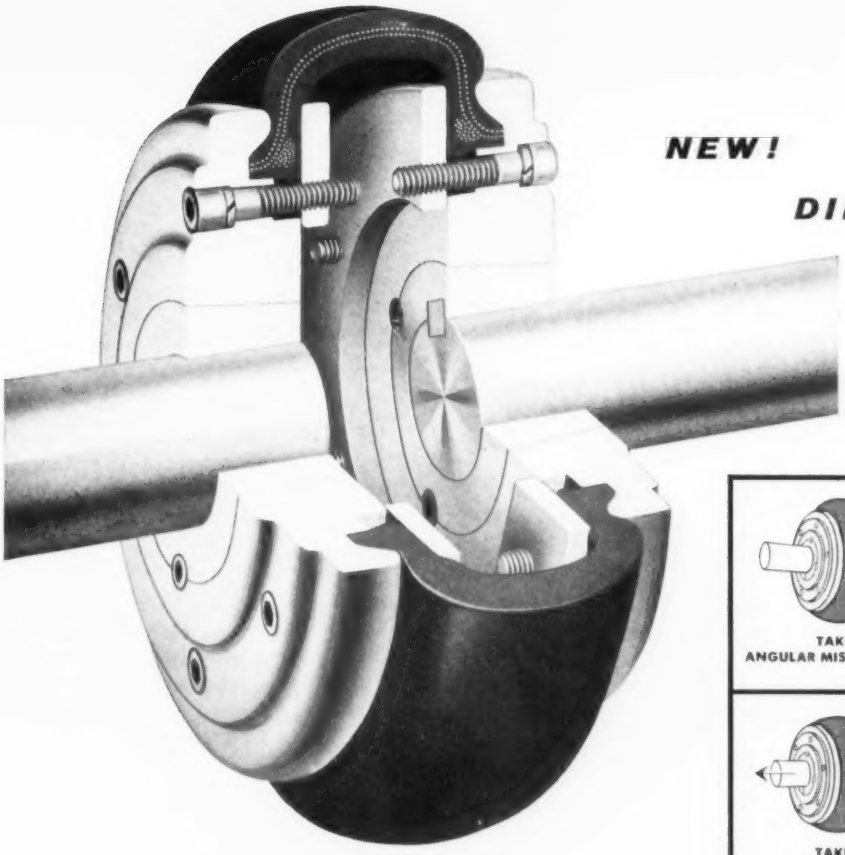
Entries are expected to come from a wide variety of industries. Announcement of the award was made by H. D. Gilbert, president, Miniature Precision Bearings, Inc., Keene, N. H.

Saves Plating Rejects

When combined with sodium cyanide and dissolved in water, a new development strips plated deposits from ferrous-base metals without the use of electrical current.

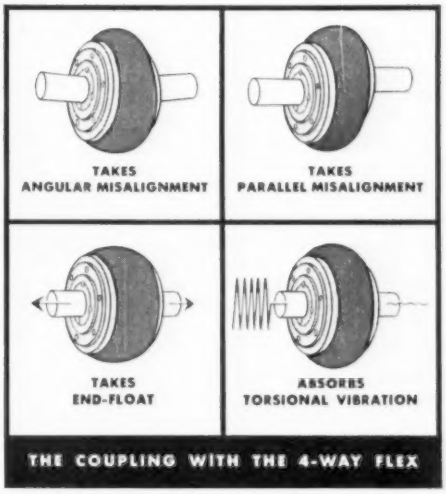
A flaky, light organic compound, the material removes copper, nickel, cadmium, zinc and silver. Part size doesn't hinder results. It doesn't etch the base metal.

Wagner Bros., Inc., Detroit, makes it.



NEW!

DIFFERENT!



Announcing

Para•flex

FLEXIBLE CUSHION COUPLING

THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment *or any combination of all three.* Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no reboring, no machining. Safety is promoted by flush design; there are no protruding parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine.*

Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 600 hp at 900 rpm. Call your distributor for early delivery to *make your own test.* You'll witness something revolutionary!

DODGE MANUFACTURING CORPORATION, 800 Union, Mishawaka, Ind.

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new methods. Look for his name under "Power Transmission Machinery" in the yellow pages of your classified telephone directory—or write us.

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ANYWHERE

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The IRON AGE

MATERIALS ROUNDUP

Rolls Big Plate Of 17-4 PH Stainless

For high-strength applications some fabricators prefer 17-4 PH stainless. This precipitation hardening material needs just low heat treating to get hardnesses to Rc 50.

Now this material is being turned out in large plate form.

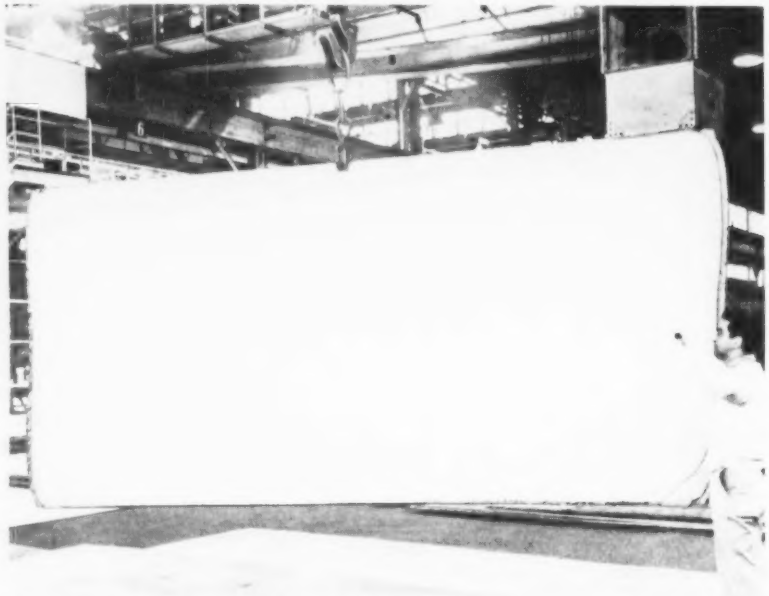
■ Corrosion resistant, high-strength 17-4 PH stainless steel is now being processed into large 1-in. thick plates. Some of these plates weigh more than 3900-lb with dimensions of 174-in. long and 79-in. wide.

Produced by G. O. Carlson, Inc., Thorndale, Pa., the plates are said to possess mechanical properties similar to straight chromium steels in the 400 series. Moreover, the stainless plate also has workability and anti-corrosion features like stainless type 304. It can be worked while in a soft state; then it can be precipitation hardened quickly for great strength, wear resistance.

Quality Control Vital — To get such desirable qualities, the firm keeps tight quality controls. It watches the material carefully, keeping the steel at an almost constant temperature from pouring through slabbing.

Formed from a true stainless steel, the 17-4 PH plate finds use in missile and aircraft manufacture, or wherever corrosion resistance and high strength are important.

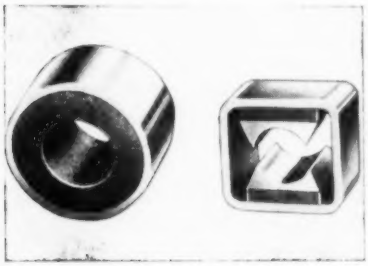
Type 17-4 PH stainless is a basic development of Armco Steel Corp., Middletown, Ohio. It's one of two Armco precipitation hardening grades available in plate form. The other is 17-7 PH, which displays properties similar to type 302 stainless.



This 1-in. thick plate of 17-4 PH stainless measures 174 in. long by 79 in. wide. It weighs more than 3900 lb.

Dc Motors Employ Ceramic Magnets

Ceramic permanent magnets can now be used in place of electromagnets for dc motor fields. Because of powerful new magnets that will not become demagnetized when opposed by powerful armature fields, it is now practical to use



Ceramic magnets can take many possible shapes and forms.

them for dc motors of all sizes. They work with tiny fractional horsepower motors to large multiple horsepower machines of 10 hp and more. This means that ceramic magnets can cut manufacturing cost.

The larger the motor, the more cost is saved. This is because the percentage of total cost of these magnetic materials decreases with size of the magnets.

Indiana Steel Products Co., Valparaiso, Ind., makes them.

Flux Penetrates

Suitable for general brazing, cast-iron welding and cast-iron brazing by the oxyacetylene process is a new welding flux. Featuring excellent weldability, it's non-fuming, non-toxic. It depresses filler metal bubbling and fuming, too. The flux is available from Ampco Metal, Inc., Milwaukee 46, Wis.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 115. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

DESIGNED FOR DESIGNERS

Designers are often stumped when looking for new methods and new materials to dress up products. The inclusion of Hendrick perforated metal in product fabrication not only helps increase a product's overall attractiveness but also adds to its saleability as well! Perforated metal, masonite, rubber, plastic, and insulated board can be used in the design of: automobiles, furniture, buildings, appliances, notions, novelties, machines, equipment, and other products. Hendrick has hundreds of attractive designs to choose from. In Commercially rolled metals and gauges to meet exact needs.

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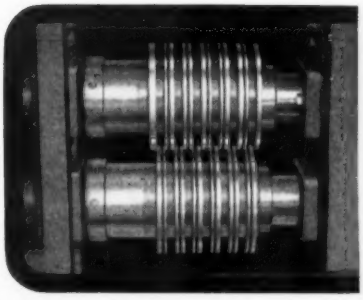
MANUFACTURING COMPANY
37 Dundaff Street, Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring—Shur-Site Treads • Armorgrids • Hydro Dehazers • Petrochemical Column Internals

CUT COSTS 3 WAYS!

WITH
COWLES
SLITTING KNIVES



Cowles knives are so accurate they can be assembled on an arbor quickly with little or no shimming, reducing set-up time. They stay on the job longer, require very infrequent interruption for re-grinding;— and — produce straight edged strip with minimum burr, preventing tie-ups in later forming operations.

For maximum satisfaction, specify Cowles, world's largest manufacturer of rotary slitting knives. Furnished in any face, diameter and bore, in our **Max-Cut; Special Alloy; Super Alloy; Circle C; Super C;** or any special analysis for slitting high and low carbon steels, stainless, silicon or non-ferrous metals. Prompt delivery!

Engineering Assistance On Any Slitting Job.

COWLES TOOL COMPANY
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Specializing in the Manufacture of
ROTARY SLITTING KNIVES • SPACING COLLARS • ROTARY TRIMMING KNIVES • ROLL TURNING TOOLS • EDGING ROLLS • CUT-OFF KNIVES STANDARD AND SPECIALLY ENGINEERED TOOLS FOR ALL FERROUS AND NON-FERROUS PROCESSING, TRIMMING AND FORMING REQUIREMENTS.

New Production Ideas

Equipment, Methods and Services

Time Clock Puts Job, Pay Data on Punchcards

Want to cut down on payroll costs? Are you paying too much to time job data? The answers to these questions may be yes. To help those who answer in the affirmative, one company has introduced this new time clock idea. It's a time unit which punches employee payroll and job cost data on cards at the source of these operations. This permits automatic accounting. With conventional recording systems, payroll and job cost data are printed on the cards. This means later manual computation, key punching and verification are necessary. Not so with the new time punch setup. Its maker feels that the recorder can save a time clerk an estimated 10 hours a week or more processing the cards of 1200 employees. The unit comes in two basic types. One takes care of "in" and "out" attendance records; the other, "start" and "stop" times of jobs, etc. (International Business Machines.)

For more data circle No. 36 on postcard, p. 115

One Man Handles and Operates Pipe Machine

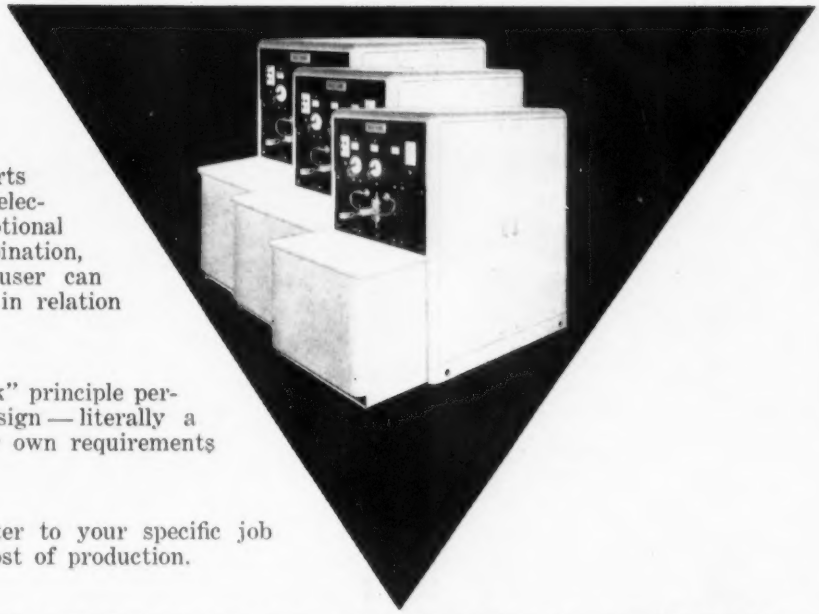
Compact and lightweight is this power drive for hand pipe tools. It has a full 2-in. standard pipe range; it'll take to 12-in. diam pipe using a special drive unit and geared tools. Weighing just 77 lb, the unit can be easily carried about by one man. It's designed for one-man operation, too. It mounts in a variety of ways to handle many jobs. In addition to a hinged, folding stand, the machine bolts directly to a work bench—or it can be clamped to a truck or other suitable mounting by means of a C-clamp attachment. Other features include: a new front chuck with rocking pivot-type insert jaws that grip all kinds of pipe securely in both right and left-hand directions; a 3-jaw universal, self-centering rear chuck for holding longer lengths of pipe; a ½-hp universal, reversible, variable speed motor with direct gear drive; speeds from 22 to 38 rpm. (The Oster Mfg. Co.)

For more data circle No. 37 on postcard, p. 115

Overhead Guard Pops Up for Easy Engine Access

Quick access to the engine is permitted by a spring-loaded overhead guard introduced recently on one maker's industrial lift trucks. Rear support of the guard is a spring-loaded strut; this swings up and out of the way, providing for the hood to tilt back during engine maintenance. Easy removal of the hook-type counterweight is provided. Front supports bolt to the fork truck chassis. Framework of the guard is of steel tubing, combining high impact and bending strength with low weight. The guard's low over-all height permits clearance through a 7-ft door opening. Yet, the overhead setup affords the driver adequate headroom. A screen guards against small falling objects. (Clark Equipment Co.)

For more data circle No. 38 on postcard, p. 115



1. Magnethermic starts with a good standard electronic heater. Ten optional features, in any combination, can be added. The user can evaluate each feature in relation to cost and need.

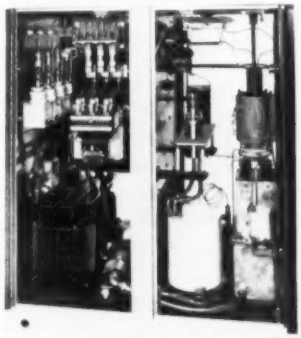
2. This "building block" principle permits flexibility of design — literally a custom design to your own requirements at minimum cost.

3. Matching the heater to your specific job reduces the per-unit cost of production.

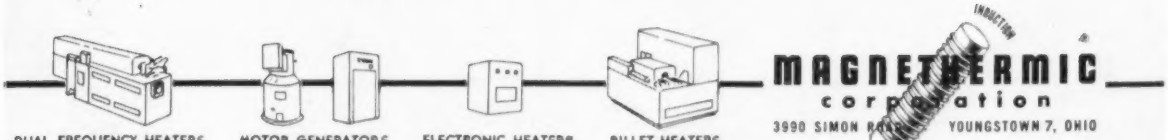
NEW IDEA IN ELECTRONIC INDUCTION HEATERS
Custom Design at Reasonable Cost....

4. Call upon Magnethermic's application and design engineers for your best combination of "building blocks".

5. New Bulletin EH-57-6 contains full information on the standard electronic induction heater; the ten optional features; ratings; specifications on 15, 30 and 40 KW; a frequency selector chart; a surface hardening table; and other data.



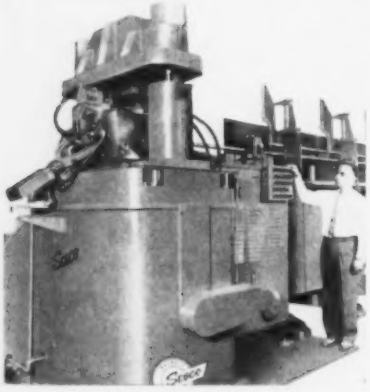
6. Bulletin EH-57-6 is available upon request. Heaters available from stock. Address your inquiry to Magnethermic, Youngstown, O.



Microfilm System Gives Print in Ten Seconds

Push-button printing for microfilm is here. With a new machine all an operator has to do is press a button; less than ten seconds later he has a print. The printing machine is also a microfilm reader. It's a two-in-one setup, completely automatic, eliminating hand processing of prints. It projects microfilm on a viewing screen in the usual manner for reading — then makes a ready-to-use print in less than ten seconds when a button is pressed. The machine prints by an automatic electro-chemical process on special white 8½ x 11 or 8 x 10½-in. paper sheets. Speed is the unit's key factor. But another major asset is its ease and simplicity of operation. Practically anyone without any training can push a button and get a good print. The reader-printer works on standard 110-v alternating current. (Minnesota Mining & Mfg. Co.)

For more data circle No. 39 on postcard, p. 115



Unit Cuts Parts to Size, Weight Accurately

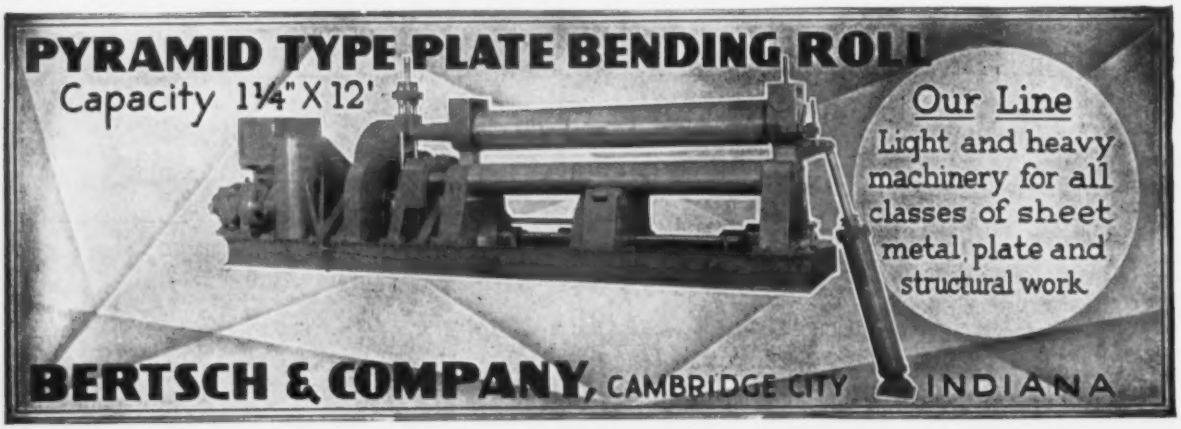
This bar feed and cutoff machine cuts parts to size and weight with accuracy. Operating with practically no noise, and little vibration, the unit cuts parts within a tolerance of 1/10 of an ounce from a finish machined bar. Thus, it reduces succeeding machining operations. The machine consists of a bar stock storage rack and loader, a hydraulic gripper bar feed, and a short-stroke underdrive cutoff unit. These self-contained units are of heavy-duty welded steel construction. The entire assembly is constructed to receive and process bars of random lengths. With minor changes, it will handle from 1 to 2-in. diam bars. Though it makes practically no scrap, what scrap there is gets disposed of automatically. Bar leads and trailing ends are treated as scrap. (Sesco, Inc.)

For more data circle No. 40 on postcard, p. 115

Torch Head Adjusts Widely Through 250°

One manufacturer is replacing its entire line of fixed angular heads with an angular machine-torch adapter that adjusts through the extremely wide range of 250°. Its cutting angle can be set without tools, and without removing the accessory from the torch. Any required angle can be set between 0° and 90° either side of vertical, and within an additional 35° above horizontal. The angular head accommodates standard acetylene, propane, and natural-gas tips. (Air Reduction Sales Co.)

For more data circle No. 41 on postcard, p. 115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Light and heavy machinery for all classes of sheet metal, plate and structural work.
BERTSCH & COMPANY, CAMBRIDGE CITY INDIANA

MACHINING PERFECTION always starts with the right steel

Pick exactly the right steel for any job from J & L's complete cold finished line

"Increased valve cap production 31% with J & L 1113 Bessemer steel"

This valve cap for drums requires considerable surface machining, drilling and tapping. Comparison test with the previously used open hearth leaded steel shows J&L "1113" leaded Bessemer steel upped production 31% . . . permitted change from a 15-second to a 10⅓-second cycle. Surface finish is smoother. J&L leaded steels assure you higher cutting speeds, longer tool life. Get facts from your distributor or write to Jones & Laughlin, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

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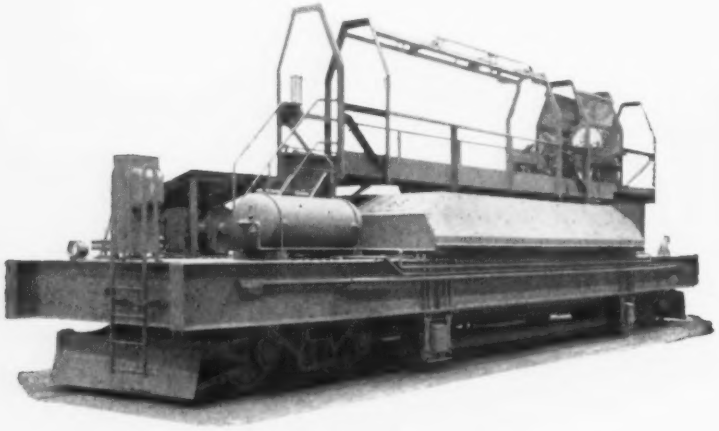
. . . a great name in steel

STOCK HOUSE OR HIGH LINE

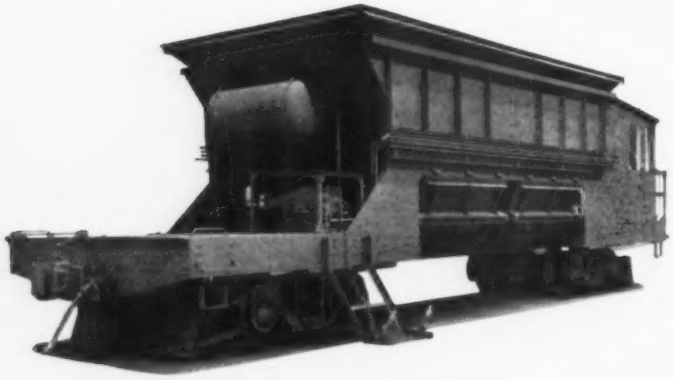
operators prefer the

DEPENDABILITY of ATLAS CARS

These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



40-TON SCALE CAR
Double Hopper Bottom Dump



75-TON ORE TRANSFER
Gable Bottom Double Side Dump

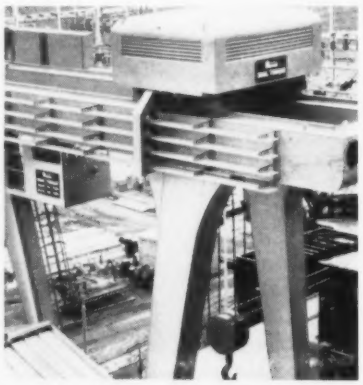
THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

NEW EQUIPMENT

Hoist Control

Applicable to both gantry and bridge cranes is a new hoist control. It eliminates auxiliary hoists. One hook provides speed with a light load and power with a heavy load. Its advantages include: (1)



dual capacity and speed with one set of hoisting and electrical equipment, (2) constant torque and speed irrespective of load on any operating point, (3) hoisting and lowering smoothly in increments of 0.005 to 0.010 in., and (4) a magnetic amplifier with dc shunt motor field weakening. (Pacific Coast Engineering Co.)

For more data circle No. 42 on postcard, p. 115

Reduction Furnace

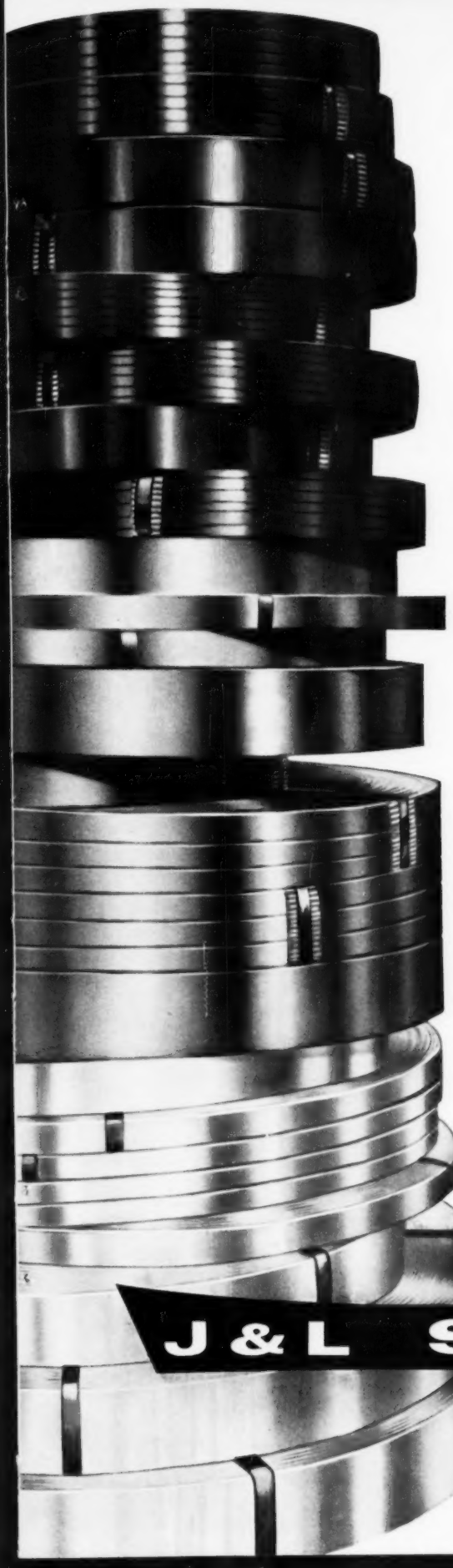
A new sectionalized metal oxide reduction furnace features an endless feed belt of mild sheet steel. However, slight modification and use of an alloy mesh belt permit use of the furnace for application other than powdered metals. (Pereny Equipment Co.)

For more data circle No. 43 on postcard, p. 115

Fluorescent Lamp

Fluorescent lamps of a new design produce 2½ times as much light as standard fluorescent lamps. A mixture of rare gases in the new lamp delivers long cathode life and maintains high brightness. This is obtained in the same conventional sized tube as present day lamps. (Westinghouse Electric Corp.)

For more data circle No. 44 on postcard, p. 115



J&L'S

"RESTRICTED SPECIFICATION" COLD ROLLED STRIP STEEL

Metal fabricators who rely on J&L for cold rolled strip steel enjoy the comfortable feeling of knowing that no better source exists for specialty strip products.

That's J&L strength—the ability to supply both standard and restricted specifications in a wide range of cold rolled strip steel grades and qualities from any one of four plants similarly equipped.

J&L does exactly that. Customers' orders involving restricted specifications can be processed at any one of three J&L plants with assurance of duplication of quality and processing and uniformity of result.

Your inquiries will be welcome, too.

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J & L STRIP STEEL

. . . how else could this job be handled so well?

Through exclusive features like these a Gerlinger fork lift truck enables each operator to multiply "manpower" and give you a new concept of profitable mass-handling:

- Exclusive Floating-Type Boom Action—faster, friction-free lift
- Counter-active Weight Distribution—better traction and maneuverability
- Pivotal Mounted Steering Assembly—stabilized load on any road
- Heavy-Duty Steel Channel Frame—bonus years of reliable service
- Maximum-Power Torque Converter Drive—smoother operation, less wear

If you move and stack loads between a few hundred pounds and twenty tons, look to the combined Towmotor-Gerlinger line to meet the most diversified specifications. This great new combination brings you the most complete range of fork lift truck capacities available from one source. More extensive service to match it, too.

Get catalog describing the lift trucks that will do the best job for you. Address: Gerlinger Carrier Co., Dallas, Oregon.

Leaders for 38 years in building Fork Lift Trucks and Carriers

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THE ONE-MAN-GANG
-GERLINGER

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The Iron Age Summary

Market Puts Mills on Defensive

Inventories are important factor in lagging market. Mill expansion contributes to easiness.

Producers tone down earlier predictions of significant pickup in fourth quarter.

■ Some months ago a prominent steel sales executive predicted: Heavy steel inventories in the hands of consumers will be a factor in the market until late in the fourth quarter. It looks as though that prediction is coming true.

Another factor in the continued easiness in most steel products is the steady increase in steel expansion, both in ingot capacity and in finishing mills.

Buyers Call Turn — Combined, they have placed steel buyers in the driver's seat, and there is no immediate indication that the situation will change in the coming weeks.

The fact that this year will be the second-best in steel from a production standpoint is little comfort to the mills. They had expected a stronger pickup from the summer low than has materialized so far.

The Hard Sell—Producers are on the defensive. They're selling hard and fighting for every sale booked. Most mills are selling on the basis of quick delivery. And their customers are taking advantage of this. In some cases, inventories are approaching the danger point. But the buyer knows he can get delivery when he wants it, so he counts on the mill to pull him through.

The chief reason behind the slow improvement in sheets and strip is Detroit. The automakers are waiting to see how their new models sell before they commit themselves to heavy tonnages.

Bright Spot — The one place where the buyer is not calling the turn is in wide-flange beams, heavy plate, and linepipe. But indications are that in 1958 he will have more to say about these products, too.

Steel salesmen in Detroit are not so optimistic as they were several weeks ago. Orders are keeping pace with auto production schedules, but the automakers have shown no inclination to rebuild inventories.

Predictions Toned Down—Steel men in Pittsburgh are looking farther ahead to a strong market improvement than was the case earlier. In cases where a pickup is predicted for November, the basis is merely an appraisal rather than something founded on actual orders. November orders are lagging. Cold-rolled sheet orders are still being taken for October delivery.

In the Midwest, the situation is somewhat the same. Incoming orders are creeping up but tonnage coming in is scattered. And a rash of small orders is being placed on a delivery basis in many cases. Some mills have toned down previous predictions on the operating rate for the fourth quarter.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,112	2,112	2,074	2,511
Ingot Index				
(1947-1949=100)	131.4	131.4	129.1	156.3
Operating Rates				
Chicago	82.0	85.0*	82.0	111.0
Pittsburgh	81.5	83.5*	80.0	102.0
Philadelphia	84.0	90.0	92.0	104.0
Valley	73.0	74.0*	74.0	99.0
West	99.0	97.0*	100.0	105.0
Buffalo	100.0	100.0	100.0	105.0
Cleveland	86.0	85.0*	81.0	107.0
Detroit	94.0	92.0*	91.0	102.0
S. Ohio River	78.0	79.0*	86.0	91.0
South	72.0	72.5	85.0	96.0
Upper Ohio R.	95.5	98.0*	92.0	107.0
St. Louis	94.0	78.0	73.0	100.0
Northeast	41.5	41.5	37.0	100.0
Aggregate	82.5	82.5	81.0	102.0

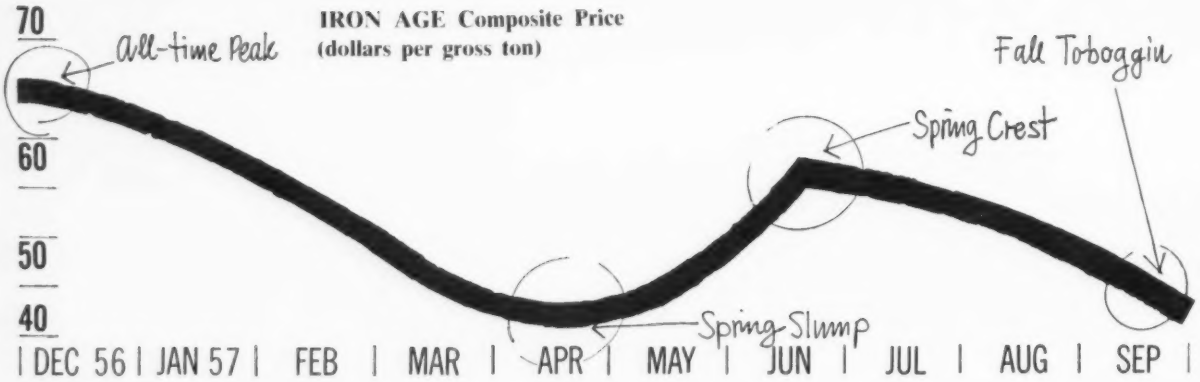
*Revised

Prices At a Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$63.04
Scrap, No. 1 hvy (Gross ton)	$40.83	$43.83	$50.17	$57.33
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	28.50	40.00
Lead, St. Louis	13.80	13.80	13.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin Straits, N. Y.	93.375	93.50	93.00	103.00
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

*Revised



Scrap: It Was a Short Summer

What Happened to Scrap Prices?

▪ The scrap industry is still staggering from the sudden collapse of the market last week.

With the benefit of hindsight many are wondering why they didn't see it coming, before it was too late. But few did.

Lists Pulled Prop — The sharp drop was triggered by the sale of industrial lists which went last week at figures far below what even the pessimists had expected. The market had been weakening for some time but, on the surface, did not indicate a complete collapse. What happened?

"There is just too big a supply of metallics for the rate of consumption," explains one broker. The supply includes scrap, synthetic scrap, pig iron and hot metal. Also important is the tonnage of semi-finished steel built up at some mills. Even with stepped-up rolling schedules, a larger use of scrap would not be immediately needed until this is exhausted.

Heavy, Hot Metal Use — Mills operated blast furnaces at more than 90 pct of capacity throughout the summer. They have been running openhearths at 70 pct hot metal. As a result, mills have been buying relatively little scrap, but not depleting inventories.

This situation set up the collapse of the industrial lists. The brokers could not line up mill commitments for the lists. Because of heavy inventories and tight money, many brokers themselves did not speculate on the lists.

Result was that the industrial tonnages went b e g g i n g. Some brokers put in token bids at what seemed ridiculously low figures. They were shocked to get it.

The Trade Says — Says one Chicago broker: "We went long on bundles in August. We'd been counting on a mid-October upturn in steel operations. The mills quit buying. Now, we find that the pick-up may be coming, but we can't wait. We've got to unload. And suppose it does come. There isn't a mill we can reach that isn't long on inventory. We'll sell. Name a price."

Laments a Detroit dealer: "The mills are filled. They aren't going to want scrap even at these prices. There's still plenty of room for prices to drop before anyone starts looking for more scrap. They just don't need it and they don't want it now."

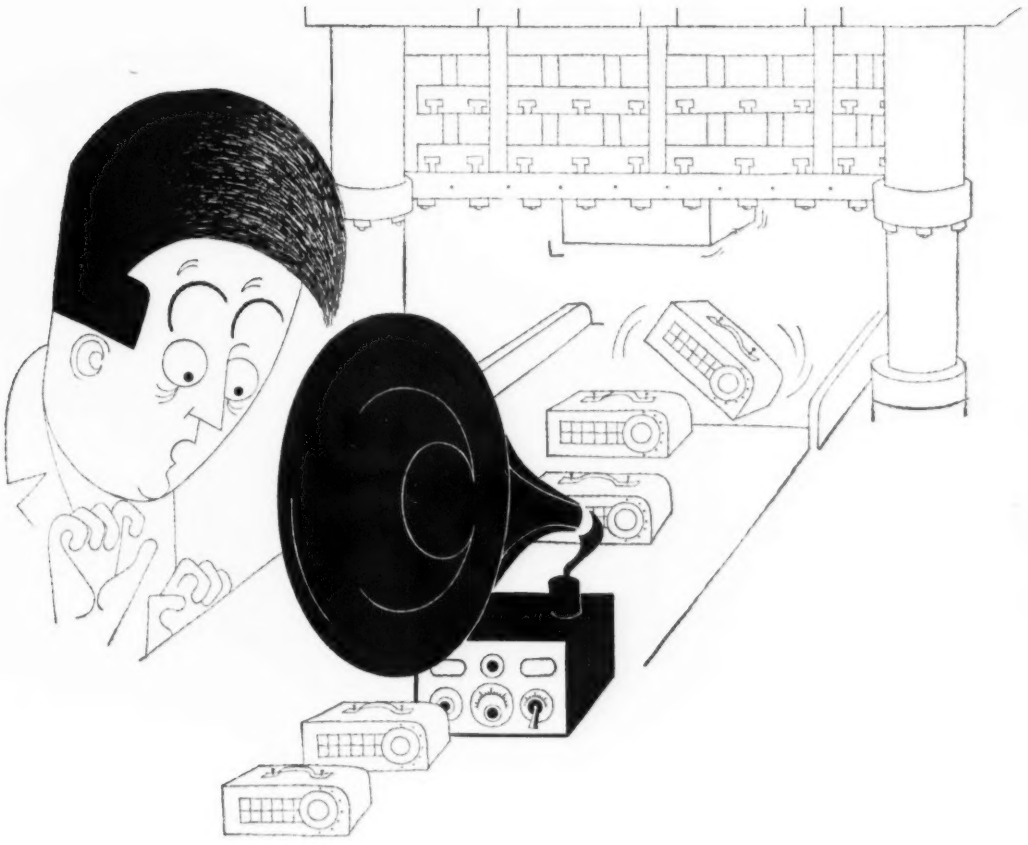
Automotive V i e w p o i n t — A spokesman for one automotive seller evaluates it this way: "It looks like the mills wanted to bring the price down from the $55 level. They couldn't see paying those prices if they could get it for $35 just by staying out of the market.

No Home—A good part of the production lists in these areas still had no home and there was frantic activity to unload.

How long will the drop last? With the market demoralized to this extent, the end is not in sight.

Who'll Come In?—But mills are now taking off some blast furnaces. The price drop is bringing scrap collections to a screeching halt. Scrap men in Pittsburgh recall that when the price of No. 2 bundles hit $35 last spring, the market exploded upward.

One major buyer agrees with the general explanation of the drop, set $40 for No. 1 heavy melting as the minimum level scrap will flow, but says his company is not worried about scrap through the rest of the year. "The minute we or any of the other mills come in for tonnage, the price will jump $10," he says.



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Will Short-Term Buying Stay?

Burden of carrying inventories remains on the sellers, not the users.

Current sales indicate it will remain that way, at least through end of quarter.

■ Steel buyers continue to saddle sellers with the burden of carrying inventories for all products except plate and structurals.

In the present market—where the fall pickup for sheet, strip, stainless, and bar has fallen short of hopes—it's an easy policy to enforce.

Typical of user attitude is the West Coast steel fabricator who says, "Why should we put money into inventory? The mills can give us what we want; warehouses are up to gills with stock; and there's plenty coming in from the East."

Mills Hustle—And, in the competitive rush to get business, the mills are bending over backwards to land sales. Order processing setups have been tightened to speed paperwork. Rolling schedules are juggled to squeeze in as many buyer requests as possible. Stocks of semi-finished and finished steel are kept on hand to telescope needed processing time on orders.

Will the picture change? The mills apparently don't believe so, at least not before first or second quarter '58. Their automotive customers seem determined to tie steel needs to demands of the public for new cars. Appliance makers, while doing a little more steel buying, are still below previous levels.

Right now the mills are more interested in snaring orders to fill October rolling schedules and in blocking out November tonnages.

Sheet and Strip—In a highly competitive situation, some mills are juggling order schedules to make fast deliveries. Warehouses are losing business to the mills because of the delivery factor. Whereas mills reported cold-rolled sheet moving better than hot-rolled in September, the reverse is true for October. **Midwest** producers indicate automotive buying of hot-rolled has been relatively better than has cold-rolled.

Bar—Cold finished bar producers in some areas are actually reducing hot bar inventories at a time when they are normally stepping up the buying rate. Result of these cold finisher cancellations and other consumer cutbacks has been a slacking in hot-rolled bar activity. In some cases, hot-rolled is available in as little as one week. Cold-finished is listed at 1-4 weeks, but sometimes can be obtained in terms of hours. Hot-rolled bar operations are reported to be about 60-70 pct of capacity.

Plates and Shapes — Universal and strip mill plate is loose, although sheared mill plate continues tight. **Pittsburgh** warehouses maintain there's no longer a shortage of plates and structurals. They report no real order pressure from customers. Light plate, even product up to 1-in. thick is still available in the **Cleveland** area for late October delivery. Lead times have been cut by the mills to 2-4 weeks in an effort to get business. With wide-flange beams still a carryover item for the mills, other structurals are easing.

Warehouses — While distributor order volume is running as high or slightly higher than month ago levels, the actual tonnages moved are either the same or less than they were four weeks ago. This reflects the customer practice of placing small, quickly-wanted orders to fill inventory holes. Ability of the mills to supply products like sheet and bar on fast delivery is hurting the warehouses. While large outlets supplying a mixed line of products are doing a little better, some of the smaller distributors indicate September business may not top August's. **West Coast** warehouses are having trouble moving strip mill tonnage bought in the East. Outlets there even have a good supply of plates in sizes ½ in. and over.

Wire Products — Some improvement from what one mill man calls "the feeble summer lows" has been achieved. But the order stepup is slight. Deliveries are still mainly off the shelf. Manufacturers' wire has bettered slightly due to buying by auto suppliers and furniture builders. Merchant wire is poor. Both small manufacturers and farm consumers are doing little ordering. Imports still plague domestic mills.

Stainless — With business slow many large producers are carrying semifinished and finished stocks so they can maintain a delivery edge on smaller mills. Utensil firms buying stocks to manufacture for the Christmas trade are doing the market some good. However, stainless deliveries are on a 2-3 day basis and the industry in general is operating at less than 50 pct of capacity.

PURCHASING AGENT'S CHECKLIST

Steel companies analyze cost of producing their own oxygen versus buying it. **P. 57**

Truck leasing rather than purchase often has advantages. **P. 62**

Five points to consider when buying vacuum arc melting equipment. **P. 96**

COMPARISON OF PRICES

(Effective Oct. 1, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Oct. 1 1957	Sept. 24 1957	Sept. 3 1957	Oct. 2 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.80
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.85
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.55
Special coated mfg. ternes	9.55	9.55	9.55	9.10
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40.75
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging, billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rod and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Oct. 1 1957	Sept. 24 1957	Sept. 3 1957	Oct. 2 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$67.76
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.84
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, cents per lb‡	12.25	12.25	12.75	10¾-11¾
74 to 76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$63.04
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$41.50*	$44.50	$52.50	$57.50
No. 1 steel, Phila. area	*40.50*	42.50	50.50	57.00
No. 1 steel, Chicago	*40.50*	44.50	47.50	57.50
No. 1 bundles, Detroit	*31.50*	41.50	46.50	56.50
Low phos., Youngstown	44.00	44.00	55.50	65.50
No. 1 mach'y cast, Pittsburgh	*54.50*	55.50	59.50	60.50
No. 1 mach'y cast, Philadel'a	*52.50*	56.50	56.50	58.00
No. 1 mach'y cast, Chicago	*44.50*	46.50	50.50	58.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	*$40.83*	$43.83	$50.17	$57.33
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	28.50	40.00
Copper, Lake, Conn.	27.00	27.00	28.50	40.00
Tin, Straits, N. Y.	*93.375*†	93.50	93.00	103.00
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	13.80	13.80	13.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*			.....
Birmingham *W9*	62.00	62.50*	66.50		.....
Birmingham *U4*	62.00	62.50*	66.50		.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50		.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	66.50	67.00	67.50		.....
Fontana *K1*	75.00	75.50			.....
Geneva, Utah *C7*	66.00	66.50			.....
Granite City *G2*	67.90	68.40	68.90		.....
Hubbard *Y1*			66.50		.....
Ironton, Utah *C7*	66.00	66.50			.....
Midland *C11*	66.00				.....
Minnequa *C6*	68.00	68.50	69.00		.....
Monessen *P6*	66.00				.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*		66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	66.50	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50		.....
So. Chicago *W8*	66.00		66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*			66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct); 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa. *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R3*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.
Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown; *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R3*; Munhall, Pa., S. Chicago, *U1*.

To identify producers see Key on p. 146

Scrap Prices Reach Two-year Low

Confused market fails to establish a floor after last week's collapse.

Low prices fail to bring out any significant orders. Composite lowest since July, 1955.

■ The market is still in a state of confusion. The trade is trying to establish some degree of order, but with little luck to date.

For the most part, prices continue down. There are few actual sales to establish firm prices anywhere. The usual differential between some markets is at least temporarily suspended in the current state of flux.

Where purchases have been made, tonnage in most cases is light and not sufficient to establish a floor. The light buys appear to be in the nature of small purchases on the down market, rather than substantial tonnages that indicate a definite level.

Much of the industrial tonnage that pulled the props from an already weak market last week is still without a home. Dealers find sales few and far between. Many of them are still sitting on heavy inventories and would like to unload—if they could.

As a result of declines in all major markets. The IRON AGE Composite Price dropped to $40.83, lowest point since July, 1955.

(For more on scrap, see p. 132.)

Pittsburgh — Prices continue to fall here. The final tabulation on a local industrial list showed prices averaging between $44 and $45 to the broker. In sympathy, open-hearth dealer grades are off $2 to $3.

Turnings, railroad scrap and cast grades are all off. There is talk that dealers will not sell if prices go lower. However, mills show little interest in buying heavily.

Chicago—The market continued to sink, hastened by the eastern market slide. Adding to difficulty of local marketers were prices paid for factory bundles last week $5 to $6 higher than bundles coming into the area.

Heavy movement in districts to the south failed to stiffen Chicago prices, which continue weak. Final shakeout is beginning to appear as a $2 to $4 drop, although evidence of further slides is strong.

Philadelphia — Price of steelmaking scrap dropped $2 a ton based on light tonnage buys by one mill. Some brokers and dealers think the bottom has not yet been reached. Others are hoping that a resumption of foreign buying will check the price slide. Virtually no scrap is moving into the yards.

New York—Prices continue to fall sharply in this market, with domestic business at a virtual standstill, and export a mere trickle. Most grades are off $2 to $4, with No. 1 heavy melting now $37 to $38.

Detroit—Price weakness of the market here was verified by a sale of No. 1 heavy melting. The sale to an out-of-town mill came as a surprise to local dealers who hadn't expected any activity in the market so soon. Although the price is lower than the usual differential between Detroit and other markets, most dealers say they would sell at that price if they could.

Cleveland — Production lists in Cleveland, which ranged from $39 to $44 last week are still waiting for a home. Bulk of the tonnage went at the higher prices, but the remainder was scattered widely.

St. Louis—Mills have adjusted their prices in line with declines in other areas, and the list is down from $1 to $3 on most items, with rails, random length, off $7.

Cincinnati — Prices dropped $7 on prime grades for a large area mill. An additional decline is expected if another mill holds off for a month.

Drop in area production lists is as much as $17 under a month ago, sharpest in years. Movement is expected to be fair at lower prices.

Birmingham—With buying almost at a standstill, the bottom seems to have dropped out of the market. Brokers say consumers are waiting to see how low the market will go, and are buying only enough to fill immediate needs. Supplies are coming in slowly to dealers, but the intake is more than outgo.

Buffalo—Prices plunged sharply all along the line. All No. 1 items dropped $8 a ton. No. 2 grades less sharply. Prices of No. 1 grade were incorrectly quoted in Sept. 26 issue. Price should have been $45 to $46 for No. 1 bundles, No. 1 busheling and No. 1 heavy melting.

Boston — Continued weakness prevails in this market. There is no action of any kind. Export and domestic markets are both depressed, with nearly all prices down.

West Coast — Mills are not taking much scrap. There's persistent talk that the Japanese steel industry is ready to re-enter the market with a purchase of 200,000 tons to be delivered by Jan. 1. This prop would certainly firm up the present soft market.

Penn-Dixie's 20-ton Plymouth Locomotive transports stone and fullers earth from quarry to crusher 8 hours a day, 5 days a week.

"Fuel savings alone amount to over $2600 a year"

Here's real economy in haulage operations: "We like our Plymouth very much . . . it is definitely faster, more efficient than the steam locomotive we used formerly," states B. B. Nall, superintendent of Penn-Dixie Cement Corp., Clinchfield, Georgia, in describing the performance of the company's 20-ton Plymouth Diesel with Torqomotive Drive.

"Over a ¾-mile route from quarry to crusher, our Plymouth Diesel saves us more than $10-per-day in fuel costs alone. Maintenance costs have been exceptionally low with a minimum of down-time in more than three years of continuous operation."

Plymouth's high operating efficiency and low operating cost make hauling, switching and spotting jobs more profitable for large and small companies everywhere. Whether your requirements call for gasoline or Diesel power, mechanical or torque-converter drive, we will gladly send you complete information on a Plymouth built specifically to meet your haulage needs. Send a brief outline of *your operations* to: The Fate-Root-Heath Company, Dept. A-2, Plymouth, Ohio.

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SCRAP PRICES *(Effective Oct. 1, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	41.00 to 42.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. punch'gs plate	46.00 to 47.00
Heavy turnings	36.00 to 37.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	63.00 to 64.00
Rails 2 ft and under	68.00 to 69.00
RR steel wheels	58.00 to 59.00
RR spring steel	58.00 to 59.00
RR couplers and knuckles	58.00 to 59.00
No. 1 machinery cast	54.00 to 55.00
Cupola cast	45.00 to 46.00
Heavy breakable cast	43.00 to 44.00

Chicago

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	41.00 to 42.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'gs plate	48.00 to 49.00
Low phos. 3 ft and under	47.00 to 48.00
No. 1 RR hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	54.00 to 55.00
Rerolling rails	59.00 to 60.00
Rails 2 ft and under	58.00 to 59.00
Locomotive tires cut	53.00 to 54.00
Cut bolsters & side frames	53.00 to 54.00
Angles and splice bars	56.00 to 57.00
RR steel car axles	62.00 to 63.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast	44.00 to 45.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	37.00 to 38.00
Cast iron brake shoe	39.00 to 40.00
Cast iron wheels	46.00 to 47.00
Malleable	52.00 to 53.00
Stove plate	37.00 to 38.00
Steel car wheels	53.00 to 54.00

Philadelphia Area

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	23.00 to 24.00
Mixed bor. short turn.	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Clean cast. chem. borings	35.00 to 36.00
Low phos. 5 ft and under	47.00 to 48.00
Low phos. 2 ft and under	48.00 to 49.00
Low phos. punch'gs	48.00 to 49.00
Elec. furnace bundles	45.00 to 46.00
Heavy turnings	35.00 to 36.00
RR steel wheels	58.00 to 59.00
RR spring steel	58.00 to 59.00
Rails 18 in. and under	68.00 to 69.00
Cupola cast	42.00 to 43.00
Heavy breakable cast	46.00 to 47.00
Cast iron car wheels	54.00 to 55.00
Malleable	59.00 to 60.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast	52.00 to 53.00

Cleveland

No. 1 hvy. melting	$39.50 to $40.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 dealer bundles	39.50 to 40.50
No. 1 factory bundles	45.50 to 46.50
No. 2 bundles	30.50 to 31.50
No. 1 busheling	39.50 to 40.50
Machine shop turn	18.00 to 19.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Cut struct'r'l & plates, 2 ft & under	45.50 to 46.50
Drop forge flashings	39.50 to 40.50
Low phos. punch'gs, plate	40.50 to 41.50
Foundry steel, 2 ft & under	45.50 to 46.50
No. 1 RR heavy melting	49.00 to 50.00
Rails 2 ft and under	68.00 to 69.00
Rails 18 in. and under	69.00 to 70.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	28.00 to 29.00
Railroad cast	51.00 to 52.00
No. 1 machinery cast	51.00 to 52.00
Stove plate	45.00 to 46.00
Malleable	57.00 to 58.00

Youngstown

No. 1 hvy. melting	$42.50 to $43.50
No. 2 hvy. melting	36.50 to 37.50
No. 1 dealer bundles	42.50 to 43.50
No. 2 bundles	33.50 to 34.50
Machine shop turn.	23.00 to 24.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	43.50 to 44.50

Buffalo

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	34.50 to 35.50
No. 1 busheling	37.00 to 38.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	31.50 to 32.50
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	25.00 to 26.00
Low phos. plate	43.00 to 44.00
Scrap rails, random lgth.	49.00 to 50.00
Rails 2 ft and under	59.00 to 60.00
RR steel wheels	46.00 to 47.00
RR spring steel	43.00 to 43.00
RR couplers and knucklers	42.00 to 43.00
No. 1 machinery cast	49.00 to 50.00
No. 1 cupola cast	49.00 to 50.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	29.00 to 30.00
Drop forge flashings	29.00 to 30.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Low phos. punch'gs plate	34.00 to 35.00
No. 1 cupola cast	36.00 to 37.00
Heavy breakable cast	32.00 to 33.00
Stove plate	32.00 to 33.00
Automotive cast	42.00 to 43.00

St. Louis

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	23.00 to 24.00
Cast iron borings	25.00 to 26.00
Shoveling turnings	25.00 to 26.00
No. 1 RR heavy melting	48.00 to 49.00
Rails, random lengths	55.00 to 56.00
Rails, 18 in. and under	64.00 to 65.00
Locomotive tires uncut	58.00 to 59.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	59.00 to 60.00
RR specialties	52.00 to 53.00
Cupola cast	46.00 to 47.00
Heavy breakable cast	40.00 to 41.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	38.00 to 39.00
Cast iron car wheels	42.00 to 43.00
Rerolling rails	64.00 to 65.00
Unstripped motor blocks	40.00 to 41.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	35.00 to 36.00
Elec. furnace, 3 ft & under	42.00 to 43.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and short turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	21.00 to 22.00
No. 1 machinery cast	38.00 to 39.00
Mixed cupola cast	29.00 to 30.00
Heavy breakable cast	35.00 to 36.00
Stove plate	30.00 to 31.00
Unstripped motor blocks	29.00 to 30.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	31.00 to 32.00
No. 2 dealer bundles	26.00 to 27.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	16.00 to 17.00
Clean cast. chem. borings	31.00 to 32.00
No. 1 machinery cast	38.00 to 39.00
Mixed yard cast	33.00 to 34.00
Charging box cast	37.00 to 38.00
Heavy breakable cast	37.00 to 38.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	29.00 to 30.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	25.00 to 26.00
Electric furnace bundles	43.00 to 44.00
Elec. furnace, 3 ft & under	41.00 to 42.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft	44.00 to 45.00
No. 1 RR hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	47.00 to 48.00
Rails, 18 in. and under	54.00 to 55.00
Angles & splice bars	52.00 to 53.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast	52.00 to 53.00
Stove plate	51.00 to 52.00
Charging box cast	27.00 to 28.00
Cast iron car wheels	40.00 to 41.00
Unstripped motor blocks	39.00 to 40.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Low phos., 18 in. and under	47.00 to 48.00
Rails, random lengths	57.00 to 58.00
Rails, 18 in. and under	67.00 to 68.00
No. 1 cupola cast	40.00 to 41.00
Hvy. breakable cast	35.00 to 36.00
Drop broken cast	50.00 to 51.00

San Francisco

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	42.00
No. 1 dealer bundles	43.00
No. 2 bundles	35.00
Machine shop turn.	$30.00 to 32.00
Cast iron borings	30.00 to 32.00
No. 1 RR hvy. melting	44.00
No. 1 cupola cast	52.00

Los Angeles

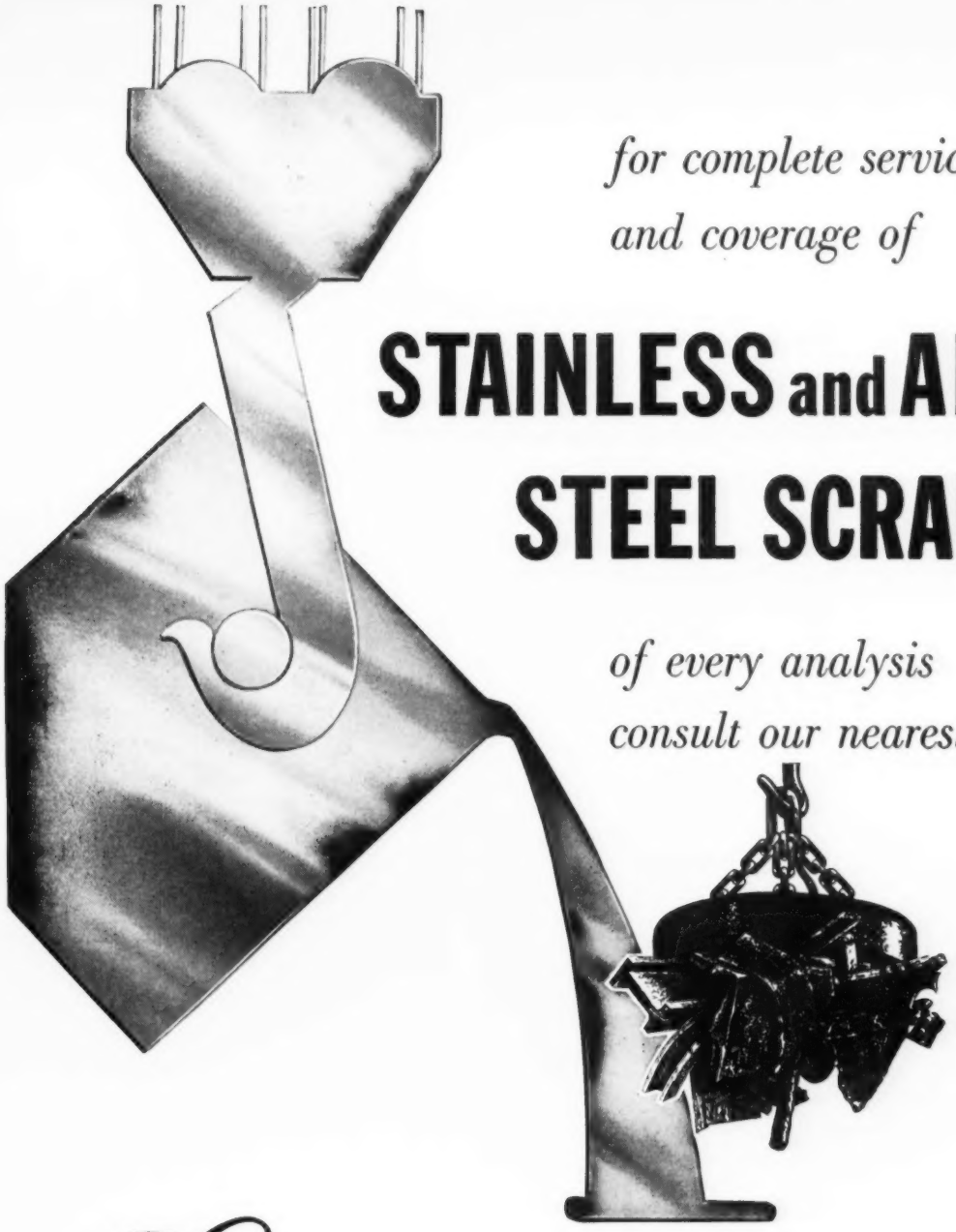
No. 1 hvy. melting	$44.00
No. 2 hvy. melting	42.00
No. 1 dealer bundles	43.00
No. 2 bundles	35.00
Machine shop turn.	20.00
Shoveling turnings	24.00
Cast iron borings	32.00
Elec. furn. 1 ft and under (foundry)	55.00
No. 1 RR hvy. melting	44.00
No. 1 cupola cast	49.00

Seattle

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	42.00
No. 2 bundles	33.00
No. 1 cupola cast	38.00
Mixed yard cast	38.00

Hamilton, Ont.

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	37.00
No. 1 dealer bundles	42.00
No. 2 bundles	31.00
Mixed steel scrap	37.00
Busheling	31.00
Bush., new fact., prep'd	42.00
Bush., new fact., unprep'd	36.00
Machine shop turn.	19.00
Short steel turn.	27.00
Mixed bor. and turn.	21.00
Rails, rerolling	51.00
Cast scrap	47.00



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Tariff Group Gets Lead-Zinc Problem

Producer committee officially asks the Tariff Commission to recommend an increase.

Domestic industry also wants import quotas, but will present a program in another petition.

Observers see no outspoken opposition to tariff boost, but predict a tough fight on restricting imports.

▪ Late last week domestic lead and zinc producers officially took the first step in what is generally conceded will result in higher lead and zinc prices.

The Emergency Lead, Zinc Committee, with Charles E. Schwab as spokesman, formally petitioned the U. S. Tariff Commission for a higher tariff on both metals.

Ask the Maximum—The producers' group asked for "the maximum rates of duty that the President may legally proclaim." Presumably, this refers to section 7A of the Trade Agreements Extension Act of 1951. Under this "escape clause" the new lead tariff would be 2.55¢ per lb, zinc 2.1¢ per lb. Current tariff on lead is 1 1/16¢ per lb, zinc 0.7¢ per lb.

Significantly, Mr. Schwab said the domestic industry wanted import quotas, but did not make this part of the current petition. Market observers say this is a good indication producers expect to get their tariff boost in a hurry, with no opposition.

No Active Opposition—Consumers are split on the subject of the higher tariff. One major lead user says the legal boost under the "escape clause" is quite fair, is figuring on paying 15¢ for lead in 1958. Another lead user, almost as big says he is opposed but will not go on record at the Tariff Commission.

Initial reports had Budget Bureau Director Percival F. Brundage opposed to higher lead and zinc tariffs on the basis of remarks written to Senate Finance Committee Chairman Byrd (D., Va.). However, the full text of the letter reveals that in answer to a request for his opinion, Mr. Brundage announced opposition to Senate Bill S. 2271, which called for a 6¢ tariff on both metals, because it "would go beyond the amounts needed for relief."

Mr. Brundage was in favor of the Administration's proposals for sliding scale tariffs which was still in committee when the last session of Congress ended.

How Soon—It looks like only a matter of time until the recommendation of the Commission for the higher tariff will be on the President's desk. Optimists are saying it will be there by Christmas. On the basis of past performance it looks more like March 1, 1958.

However, on the issue of import quotas, domestic producers will run into what one consumer calls "adamant opposition from a united front of consumers and foreign producers."

Time - Consuming — No matter which way the final ball bounces on this issue, the combination of hearings and closed-door study necessary before recommendations for executive action can be taken will probably use the better part of a year. And the State Dept. is likely to get into the act since import quotas would require extensive negotiation and some concession.

Magnesium

The Magnesium Assn. reports cast shipments in July were off.

However, since the major part of the decline was accounted for by a drop in anode shipments, the association interprets this "as an indication that a stabilization of demand is developing."

(net tons)	July 1957	June 1957	July 1956
sand	601	638	565
perm. mold	73	66	70
anode	379	569	614
die	219	214	157
total	1272	1487	1405

Tin prices for the week: Sept. 25—93.375; Sept. 26—93.75; Sept. 27—93.75; Sept. 30—93.375; Oct. 1—93.375.*

* Estimate

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in September based on quotations appearing in THE IRON AGE, were as follows:

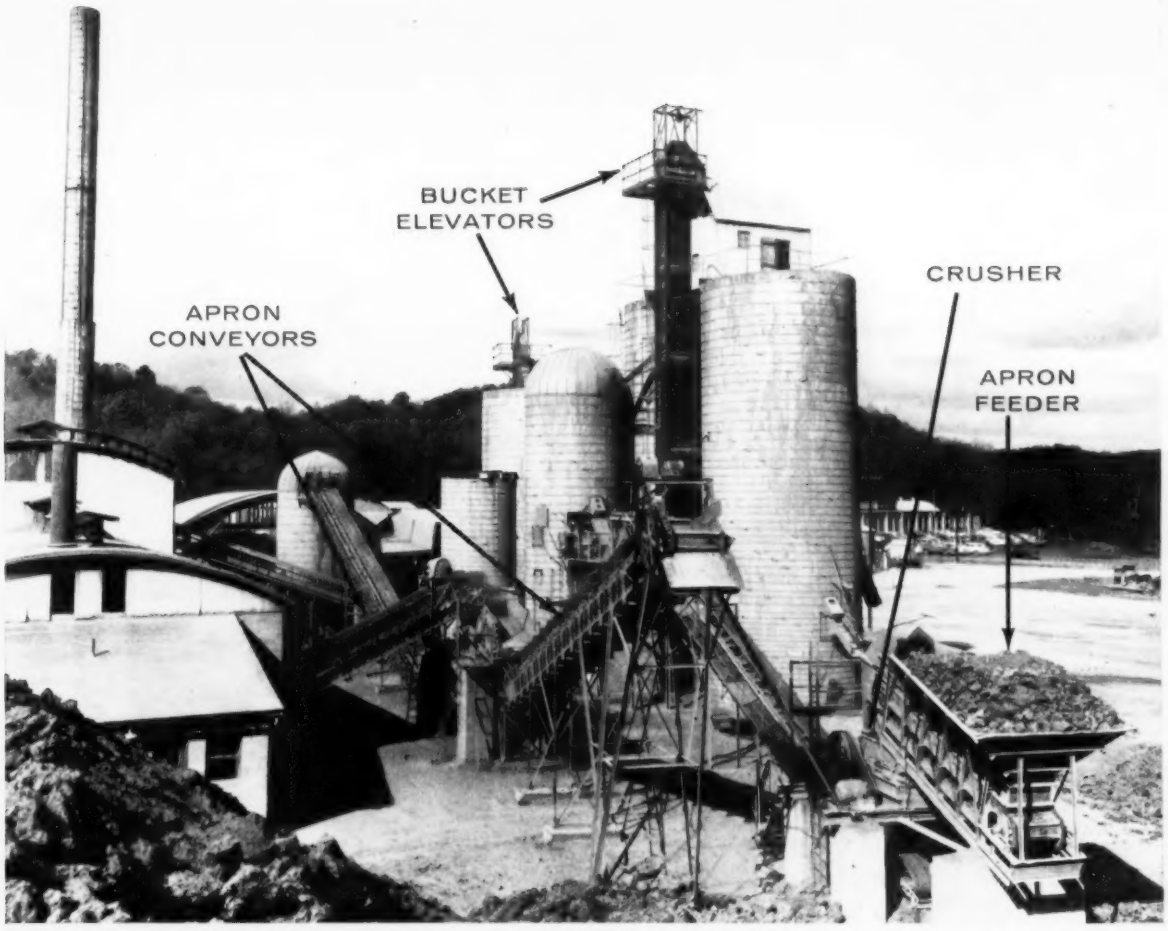
Electrolytic copper, del'd Conn. Valley	27.00
Copper, Lake	27.00
Straits Tin, New York	93.439
Zinc, E. St. Louis	10.00
Lead, St. Louis	13.80
Aluminum ingot	28.10

Note: Quotations are going prices.

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	28.10	27.10	8/1/57
Aluminum Ingot	26.00	25.00	9/1/57
Copper (E)	27.00	28.50	9/3/57
Copper (CS)	26.00	25.50	9/13/57
Copper (L)	27.00	26.50	9/3/57
Lead, St. L.	13.80	14.80	6/11/57
Lead, N. Y.	14.00	15.00	6/11/57
Magnesium ingot	36.00	34.00	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	165-250	165-225	5/5/57
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig. Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 142.



Still other Jeffrey equipment, not visible here, is contributing to the high efficiency of this concrete products plant.

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In addition to the units named, the following Jeffrey equipment is widely used in the aggregate, stone, sand and gravel, clay, phosphate and sulphur rock industries:

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NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1,420	$1,893	$2,367	$2,839
.024 gage	1,774	2,366	2,957	3,549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	108.1
AZ31B Spec.		93.3	95.7	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks		87	

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	49.13		46.36	49.32
Brass, 70/30	43.02	43.56	44.25	45.93
Brass, Low	45.50	46.04	45.44	48.31
Brass, R.L.	46.37	46.91	46.31	49.18
Brass, Naval	47.27		41.58	50.68
Muntz Metal	45.39		41.20	
Comm. Bz.	47.78	48.32	47.72	50.34
Mang. Bz.	51.01		45.11	
Phos. Bz. 5%	68.07		68.57	

Free Cutting Brass Rod 31.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis.... $ 1.31
Cobalt, 97-99% (per lb) .... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz..... $86 to $89
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $243 to $245
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz... $23 to $24
Platinum, dollars per troy oz... $82 to $87
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 90.625
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium ..... $ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 27.75
No. 120 ..... 26.75
No. 123 ..... 25.25
80-10-10 ingot
No. 305 ..... 31.75
No. 315 ..... 29.75
88-10-2 ingot
No. 210 ..... 39.25
No. 215 ..... 35.00
No. 245 ..... 31.25
Yellow ingot
No. 405 ..... 22.50
Manganese bronze
No. 421 ..... 25.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.75-26.50
0.60 copper max. 25.50-26.00
Piston alloys (No. 122 type).. 23.25-25.00
No. 12 alum. (No. 2 grade) ... 22.25-23.00
108 alloy 22.75-23.50
195 alloy 25.25-26.75
13 alloy (0.60 copper max.)... 25.50-26.00
AXS-679 ..... 22.75-23.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 24.00-24.50
Grade 2—92-95% 22.00-22.50
Grade 3—90-92% 21.00-21.50
Grade 4—85-90% 19.00-20.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	17⅜	15¾
Red brass	20¼	19½
Comm. bronze	21	20¼
Mang. bronze	16½	15⅝
Yellow brass rod ends	17⅛	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21½
No. 2 copper wire 20
Light copper 17¾
*Refinery brass 19¼
Copper bearing material 18¼
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21½
No. 2 copper wire 20
Light copper 17½
No. 1 composition 19¼
No. 1 comp. turnings 18¾
Hvy. yellow brass solids 13½
Brass pipe 17½
Radiators 15

Aluminum

Mixed old cast. ..... 14 —14½
Mixed new clips ..... 16½—17
Mixed turnings, dry ..... 14½—15½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 18 —18½
No. 2 copper wire ..... 16 —16½
Light copper ..... 14½—15
Auto radiators (unsweated).. 12¼—12½
No. 1 composition ..... 16 —16½
No. 1 composition turnings... 15½—16
Cocks and faucets ..... 12½—13
Clean heavy yellow brass.... 11½—12
Brass pipe ..... 13 —13½
New soft brass clippings .... 13½—14
No. 1 brass rod turnings .... 11¾—12¼

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 11 —11½
1100 (2S) aluminum clippings 14 —14½
Old sheet and utensils ..... 11 —11½
Borings and turnings ..... 7 — 7½
Industrial castings ..... 11 —11½
2024 (24S) clippings ..... 12½—13

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 50-55
Clean nickel turnings 45-50
Nickel anodes 50-55
Nickel rod ends 50-55
New Monel clippings 37-40
Clean Monel turnings 25-30
Old sheet Monel 35-38
Nickel silver clippings, mixed. 20
Nickel silver turnings, mixed. 17

Lead

Soft scrap lead ..... 9½—10
Battery plates (dry) ..... 4¼— 4½
Batteries, acid free ..... 2¾— 3

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 15½—16
Siphon tops 42
Small foundry type ..... 13 —13¼
Monotype ..... 13 —13¼
Lino. and stereotype ..... 12 —12¼
Electrotype ..... 11 —11¼
Hand picked type shells ..... 8 — 8½
Lino. and stereo. dross ..... 3¾— 4
Electro. dross ..... 3 — 3¼

(Effective Sept. 30, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.50 *P2*		5.50 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.	$80.50 *N8*	$101.00 *N8*	$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.525 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.					5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.825 *K1*	9.00 *K1*				
	Geneva, Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

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STEEL PRICES

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		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled *18* ga. & hvyr.	Cold rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25* lb. base box	Electro* *0.25* lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana Cal.	5.825 *K1*	7.30 *K1*				8.175 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50c from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25c.

ELECTRO: 0.50-lb. add 25c; 0.75-lb. add 65c; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65c.

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STEEL PRICES

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		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.70 *P2*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.50 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.	5.65 *N8*	5.65 *N8*	7.65 *N8* 7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.30 *J3* 7.50 *P8,B5*	6.475 *J3* 6.575 *G3*	8.775 *R3* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. **Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B5*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B5*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt., 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Sept. 30, 1957)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.74	T-1
18	4	1	—	5	2.445	T-4
18	4	2	—	—	1.905	T-2
1.5	4	1.5	8	—	1.10	M-1
6	4	3	6	—	1.49	M-3
6	4	2	5	—	1.215	M-2

High-carbon chromium ..... .925 D-3, D-5
Oil hardened manganese ..... .475 O-2
Special carbon ..... .36 W-1
Extra carbon ..... .36 W-1
Regular carbon ..... .305 W-1

Warehouse prices on and east of Mississippi are 1¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				14.75
Cleveland *R3*				9.75			
So. Chicago *R3*							
Ensley *T2*	5.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	5.525					6.60	
Huntington *C16*		6.50					
Ind. Harbor *I3*	5.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B3*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B3*	5.525	6.50	6.975			6.60	
Lebanon *B4*			6.975		14.50		14.75
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J3*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B3*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R2*				9.75			

COKE

Furnace, beehive (f.o.b.) Net-Ton
Connellsville, Pa. ..... $15.00 to $15.75
Foundry, beehive (f.o.b.)
$17.50 to $19.00
Foundry oven coke
Buffalo, del'd $31.75
Detroit, f.o.b. 30.50
New England, del'd 31.55
Kearney, N. J., f.o.b. 29.75
Philadelphia, f.o.b. 29.50
Swedeland, Pa., f.o.b. 29.50
Painesville, Ohio, f.o.b. 30.50
Erie, Pa., f.o.b. 30.50
Cleveland, del'd 32.65
Cincinnati, del'd 31.84
St. Paul, f.o.b. 29.75
St. Louis, f.o.b. 31.50
Birmingham, f.o.b. 28.85
Milwaukee, f.o.b. 30.50
Neville, Is., Pa. 29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

Gross Ton

Openhearth lump $12.70
Old range, bessemer 11.85
Old range, nonbessemer 11.70
Mesabi, bessemer 11.60
Mesabi, nonbessemer 11.45
High phosphorus 11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Hermetic		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 80	19.20
Trans. 52	17.10	Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I5*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N6*); Vandergrift (*U1*); Warren, O. (*R5*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) $135.00
No. 1 Ohio 120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill. 120.00
No. 2 Ohio 103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00) 21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $150.00
Childs, Hays, Pa. 155.00
Chicago District 160.00
Western Utah 175.00
California 180.00
Super Duty
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 157.00-160.00
Silica cement, net ton, bulk, Latrobe 28.50
Silica cement, net ton, bulk, Chicago 25.50
Silica cement, net ton, bulk, Ensley, Ala. 26.50
Silica cement, net ton, bulk, Mt. Union 24.50
Silica cement, net ton, bulk, Utah and Calif. 37.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt. $165.00
Standard chemically bonded, Curtiner, Calif. 115.00
Burned, Balt. 99.00

Magnesite Brick

Standard Baltimore $131.00
Chemically bonded, Baltimore 116.00

Grain Magnesite St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk. $73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 46.00
in sacks 52.00-54.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in:
Pa., W. Va., Ohio $16.75
Midwest 17.00
Missouri Valley 15.00

(Effective Sept. 30, 1957)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	173	187		212	193	8.65	9.20
Aliquippa *J3****	173	190			190	8.65	9.325
Atlanta *A8***	175			208	199	8.50	9.10
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4****							
Cleveland *A6*							
Cleveland *A5*						8.65	
Crawf'dav. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	8.95‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184	197		219	203	9.00	9.675
Johnstown *B3***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *B2****						9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R3*	173	187			193	8.65	9.20
S. San Fran. *C6*†				236		9.60	10.15†
SparrowsPt. *B3****	175			214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A5*	179					8.95	9.50
Williamsport *S5*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** 10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26 to 0.40	0.41 to 0.60	0.61 to 0.80	0.81 to 1.05	1.06 to 1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	...	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J1*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅝ in. and smaller	63

Rivets

Base per 100 lb

½ in. and larger $12.25

Pct. Off List

7/16 in. and smaller 19

Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, packaged

⅜" diam. and smaller x 6" and shorter ..... 40 — 26

½", ⅝", and 1" diam. x 6" and shorter ..... 22 — 3

⅜" diam. and smaller x longer than 6" ..... 8 — +13

½", ⅝", and 1" diam. x longer than 6" ..... + 6 — +32

C-1018 Steel

Full-Finished Cartons Bulk

¼" through ⅝" dia. x 6" and shorter ..... 58 — 49

¾" through 1" dia. x 6" and shorter ..... 45 — 33

Minimum quantity ¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Quantity	Discount Mach. Screws	Stove Bolts
Plain Finish			
Cartons		19	32
Bulk			
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	25,000-200,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Quantity	Discount Hex	Square
In Cartons		16	19
In Bulk			
⅜" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	45.00
Electrodeposited	36.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	17.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	102.25
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.13 per lb.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	73.20
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 lb	59.00
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, West of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.90
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	37.4¢ to 41.5¢
Copper electrolytic	41.25¢
Copper, reduced	41.25¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe, 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	$1.02
Stainless steel, 316	$1.20
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.75 (nominal)	
Zinc, 10 ton lots	18.5¢ to 31.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68				
Baltimore	$.10	8.38	8.88	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57				
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.53	12.93*	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.60	11.22	8.65	9.05	8.65	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.65	19.35	18.40
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.74	19.44	18.54
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75		8.60	9.05	9.10	9.05	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	9.60	10.85	11.75	9.65	9.65	9.70	9.80	12.85	17.25	15.00	21.05	19.25
Memphis	.15	8.02	9.22		8.12	8.35	8.39	8.25	9.85				
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.42	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00			8.40	8.35	8.70	8.45	10.70				
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		9.50	11.20	11.55	11.35	8.30‡	9.65	9.65	14.65	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	11.05	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.10	14.05	16.55	15.85	20.65	19.45
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.25	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.01	19.01	18.81
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other or with galvanized sheets for quantity.

†† 10¢ zinc. † Deduct for country delivery. ‡ 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Sept. 30, 1957)

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si... 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 26.50
0.025% C (Simplex) 36.75
0.10% C, 50-52% Cr, 2% max Si.... 37.75
8.50% max. C, 50-55% Cr, 3-6% Si.. 25.00
8.50% C, 50-55% Cr, 3% max. Si... 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe....	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80-85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	13.00	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
		90% Si....	19.50

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

(Effective Oct. 1, 1957)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.33

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-88% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots $2.15

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Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

Mild Fall Upsurge At Philadelphia

Used machinery buyers there began making more inquiries during September.

The increase in interest followed a slow August and dealers have their fingers crossed.

▪ September brought a mild revival in customer interest to the Philadelphia area used machinery market. The upsurge, a moderate one at best, followed a very quiet August.

Not all dealers noted the improvement. Some indicate the market is still pretty quiet. It's clear that buyers are not waiting around to sign purchase agreements. Dealers have to hunt them out and do a lot of talking to get sales.

Answer The Phone—Here's how one dealer views recent developments in the market: "July was a surprisingly good month. August and the first week in September were slow. However, during the rest of September we got a substantial increase in phone calls and mail inquiries from potential buyers. And when this happens we can generally expect sales to follow as a natural result."

His optimism, however, is tempered about the future, "Will the improvement continue? I wish I knew. We seem to get a good spell for about three or four weeks, then things slack off again. However, the past month was good and maybe it'll stay that way."

No Easy Terms—Current buying, however, does require more time from inquiry to sale. In the tight money market buyers are having a tougher time arranging financing. However, dealers report those known to have a good credit standing or with order backlogs usually don't have too much trouble in this connection.

Uncertainty about the business outlook is delaying the buying plans of some used machinery customers. They apparently don't want to commit themselves until they see a firm prospect of staying busy after they get the tools.

Those Busy Auctions—Dealers get renewed optimism about the future when they visit used machinery auctions. There, with independent buyers outbidding them and paying high prices, the dealers are reassured that equipment is wanted even when its cost is high. The dealers themselves continue to do little buying at the auctions.

While heavy machine tools — millers, grinders, lathes—are accounting for some of the activity in the Delaware Valley market, other non-machining items are the really big sellers. These include electrical motors, generators, and transformers, spot welders and cranes.

Export of used equipment from the area continues at a fair rate. Older standard machine tools are the principal items wanted and bought for delivery outside the U. S.

Coming Auction

Heavy stamping, sheet metal, welding and tool room machinery, as well as raw materials and dies for the manufacture of lawn furniture, switch and outlet boxes will be auctioned at Brumby Metals, Inc., Decatur, Ga. on Oct. 8.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" Kling Pyramid Type
12' x ½" Hilles & Jones Pyramid Type. Two Motors & Air Operated Drop End
16' x ⅝" Ransome, Pyramid Type
BRAKES—LEAF TYPE
12' x ¼" Dreis & Krump
12' x ⅛" Dreis & Krump No. 228
BRAKE—PRESS TYPE
12' x ⅛" Cincinnati
CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span 220/3/60
5 ton Cleveland	60' Span 115 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton Shepard Niles	38' Span 440/3/60
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Shepard Niles	52' Span 230 Volt D.C.
15 ton Shepard Niles	55' Span 220/440 A.C.
15 ton Niles	75' Span 220/3/60
20 ton P&H	55' Span 220/440 A.C.
120 ton Shepard Niles	77' Span 220/3/60

CUT OFF MACHINE
#2A Modern Automatic Cut Off Machine, For Pipe, Tubing, Bars to 2" O.D.
FORGING MACHINES
1" to 5" Acme, Ajax, National
HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb to 20,000 lb. Incl.
HEADERS
#250C Manville Solid Die Single Stroke
#4 Waterbury Farrel DSOP, Capy. ⅝" x 6"
LATHES
24" x 23' Monarch
36" x 25' Niles

LEVELLERS—ROLLER
48" Aetna 17 Rolls 3⅜ dia.
54" Newbold 16 Rolls 4" dia.
66" Aetna 17 Rolls 4⅜" dia.
NAIL MAKING MACHINE
No. 00 National. Capacity ⅝" x 12" Spikes or rods
PLANER
72" x 72" x 16' Detrick & Harvey Four Head
PLANER—PLATE EDGE
35' Southwark, 16 Pneu. Jacks, Capy. 1½"
PRESSES——HYDRAULIC
500 ton RPM Fastraverse, Bed 36"x36"
1500 ton Bliss, 15" Stroke, Bed 49"x48"
1500 ton Mesta Steam Hydr. Forging Press
2000 ton Bliss 18" Stroke Bed Area 54"x55"
4500 Baldwin-Lima-Hamilton Hydr. Forging Press
PRESSES——STRAIGHT SIDE
100 ton Clearing F1100, 14" Str. Bed 36x36"
180 ton Hamilton #847, 12" Str. 85½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 30", Bed 44"x38"
250 ton Bliss #88 12" Str. Bed 29"x29"
250 ton Bliss #81 7½" Str. Bistr 33"x39"
PRESSES—KNUCKLE JOINT
800 ton Clearing K-1600-36, 4" stroke, Bed 36"x36"
1500 ton Verson, 4" Stroke, Bed 48x48", Architectural Jaw
PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw Capy. 1¼"x1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
#7 Kling, 72" Throat, With Thomas Duplicator
ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
8" x 10" Schmitz Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 30" Farrel Two Stand Two High
20" x 36" Single Stand Two High
26" x 72" Cold Rolling Mill
ROLL—CORRUGATING
12" Stamco, Rolls 24" Dia. Corrugations 2.66"
ROLL—PLATE STRAIGHTENING
72" Niles, 7 Rolls 9" Dia. Motor Driven
SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"
SHEARS—GATE
6' x 1" Hilles & Jones #6
12" x ¾" Niagara Model 1212, NEW 1951
SHEAR LINES
36" x .020 Ga. Hilden Shear Line
60 x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line
SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
10' x ¼" Cincinnati #1810
10' x ⅜" Cincinnati #2510
SHEARS——ANGLE
6 x 6 x ⅜ Hilles & Jones
4 x 4 x ⅝" Long & Allstatter
SLITTERS
24" Yoder Slitting Line
36" Paxon Slitting Line
STRAIGHTENERS
No. 3 Medart 3 Roll. Capacity to 4½" Tubing
Kane & Roach Roll Straightener & Cut-off Capacities 7/16" to ⅞" Hex Bars
SWAGING MACHINES
#4 Fenn, Capacity 2¼" Tubing, LATE
#6½A Fenn, Capacity 2¼" Tube 3¾" Solid 10" Die Length Hydraulic Feed, LATE

• Manufacturing

A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

• Equipment

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

HIGH GRADE TOOLS

7½" National high duty air clutch forging and upsetter
4" National high duty upsetting and forging machine, late (2)
3"-3½" Ajax upsetting and forging machine, steel frame
3" National high duty upsetter, air clutch
3" Ajax upsetter, air clutch
1½" National upsetting and forging machine, hardened ways (2)
Economy Type R automatic threading or pointing machines, 1948 (2)
10½" x 10½" No. 3 Motch & Merryweather cold saw, late, MD
10" x 10" Racine hydraulic Shear-Cut metal saw
750 ton No. 3 National Maxipress, air clutch, new 1945
60 ton No. 600 8 Perkins OBI press, new 1950
800 ton Model 2E48-800 Hamilton straight side single crank, air clutch
250 ton Williams White & Co. four post upward working hydraulic press
150 ton HPM Hydro-Power Fastraverse hydraulic press
350 ton No. 18T Cleveland single crank double action toggle drawing press
260 ton No. 795½-72 Toledo double crank toggle drawing press
200 ton 7-72" Bliss double crank straight side tie-rod frame press
126 ton Model 60-D-66 Cleveland straight side double crank tierod frame single geared press
600 ton No. 664 Toledo tierod frame knuckle joint coining press
400 ton No. EG 54 Ferracute upward working coining press
30" x 30" x 8' Cincinnati Hypro 2 rail, one right hand side head, dial feed planer
Economy type KK automatic bolt head shaving and pointing machine

Ask for your list No. 206

MILES MACHINERY CO.
PHONE SAGINAW PL 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
4000 lb. Chambersburg Double Frame Steam Forg. Hammer
2500 lb. Erie Single Leg Steam Forg. Hammer
Bliss Trimming Presses Tie Rod Construction Side Shears Capacities 113, 150, 190 tons
United Engineering & Fdry. Alligator Shear Clutch operated; Cap. 6½" Sq.
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6' x 10 ga. Cincinnati Squaring Shear ¼" x 8' Pexto Gate Shear; 20" throat
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3" air clutch
Williams White Bulldozers from 5-ton to 300-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
No. 3 Waterbury Farrel Progressive Header, Cap. ½"; 4 stations and 1 Cutoff

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1919 W. 74th Street, Chicago 36, Ill.

REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	D.C. Volts	A.C. Volts
5	1500	Al.Ch.	514	350/700	13800/6900/4160
1	1500	G.E.	514	250	2300/4000
1	1450	Whse.	900	600	2300/4000
2	1250	Al.Ch.	720	600	2300/4000
1	850	G.E.	720	240/350	2300
1	725	Whse.	900	600	2300/4000
1	500	Cr.Wh.	720	600	2300/440
1	500	G.E.	900	250	2300
4	300	Whse.	1200	125/250	2300
1	300 (3-unit)	Al.Ch.	1200	250/300	2300
2	200	Whse.	1200	125/250	2300/440
2	150	Rel.	1200	125	2300/440
1	150	Whse.	1200	125/250	2300/440
1	150	G.E.	1200	250	4600/2300
1	100	Whse.	720	125/250	220
1	75	Whse.	1200	125/250	2300

2—400 KW. G.E. sealed Ignitron Mercury Arc Rectifiers complete with AC and DC switchgear and 475 KVA Pyranol Transf. 2400 V. 3 ph., 60 cycle.

DIRECT CURRENT MOTORS
230-Volt

Qu.	H.P.	Make	Type	R.P.M.
1**	1500	Whse.	Encl.	600
1**	700	Whse.	Encl.	143
1	700	Whse.	Encl.	300/700
2**	600	Whse.	Mill	300/1600
2	600	Whse.	QM	110/220
1	400	G.E.	MPC	450
1	300	Whse.	Mill	300/900
1	300	Whse.	Mill	300
2	275	Whse.	QM	425/850
1	200/250	El.Dy.	Ped. Brg.	400/1200
1	180	G.E.	MPC	400
1	175	G.E.	CD-175-A	850/1025
1	125	Whse.	SK-184	575/850
1	80	Rel.	651-T	575/1150
1	80	El.Dy.	25-S	525/1050
1	60/75	Whse.	SK-151	250/1000
1	50	Whse.	SK	500/1500
1	50	Whse.	SK-141	250/1000
2	30/40	Whse.	SK-143	500/1500
1	35	Whse.	SK	250/1000
1	22½	Whse.	SK-150	400/1200
1	25	Whse.	SK-121	200/1200
2	15	Whse.	SK-93	575/1725
3	5/7½	Rel.	T.E.F.C.	337/1350

**—600 volts
All others—230 volts

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.
Cable Address "Macsteel" Philadelphia, Pa.
Phone Davenport 4-8300

Leveller 17 Roll Backed Up 3" by 30" Fessler.
Leveller 5 Roll 5¼" by 30" Hvy. Duty Fessler.
Grading Mill 6" by 5" Standard. 2 Hi Roller Bg.
Diesel Generator 60 KW 250 V DC Cummins GE.
Compressor 4,000#. 150 HP Syn Mtr. Torpedo Charger.
MG Set GE 250 KW 250 V DC 720 RPM 375 HP 220 v.
Tube Bender W&W 1¼ Universal Hyd. 15HP 440 v.

F. H. CRAWFORD & COMPANY
30 Church Street New York 7, N. Y.

BENNETT MACHINERY CO.

800 TON MILES WHEEL PRESSES
(2) Late Type 800 ton Wheel Presses, 96" between bars; max. dist. ram and resistance head 9'3" wgt. each 65,000 lbs.
(1) 32" Ohio Dreadnaught Shaper, M. D.

375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-8996 N. Y. Phone: LOngacre 3-1222

B & S No. 2 Surface Grinder, Exc. spin.
Cinn. 10" x 18" Plain Grinder, 1938.
W & S No. 1A Turret, bar, 1929.
Grant No. 103 Spinners.

D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

1—34" REVERSING HOT STRIP MILL CONSISTING OF:

1—Slab re-heating furnace 44" wide x 93'4" long, 4 heating zones, oil and gas burners.

1—Mill drive motor, reversing, 2500 HP, 75/150 RPM, 600 volt D.C., with controls.

1—28" x 40" 2-high reversing mill having Morgoil bearings in roll stand, Timken bearings in pinion stand, universal spindles with carriers, 75 HP motor screw-down.

2—Re-heating coiling furnaces, each 50" wide, for gas or oil fuel, for coiling and uncoiling strip under tension while being rolled to thinner gauges.

1—Delivery table, 38" wide x 136'6" long, with anti-friction bearings. Speed 900 FPM.

1—Coiler 24" dia., driven by 100 HP, 485/1200 RPM motor. Timken bearings. Air push-off.

1—Coil discharge gravity conveyor 70'4" long.

1—Main motor-generator set for supplying reversing motor; also auxiliary generators.

All of the above equipment is in good operating condition, has been used very little. Further details will be furnished upon request.

FRANK B. FOSTER, INC.

2220 Oliver Building, Pittsburgh 22, Pa.
cable: "Foster, Pittsburgh" Telephone ATlantic 1-2780

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	Elliott		475	320
1	2250	Elliott		600	200/300
1	2200	G.E.	MCF	600	400/500
1	1750	Elliott		250	125/250
1	1375	G.E.	MCF	475	1300
1	1200	G.E.	MCF	600	450/600
1	940	Whse.	QM	250	140/170
3	800	G.E.	MCF	250	480/750
3	450	Whse.		550	415
2	300	G.E.	MPC	250	400
2	200	Whse.	CR-207-4	250	850-1200
2	125	Whse.	SK-430	250	450-1200
1	150	G.E.	CDHB	600	250-700
1	150	Cr. Wh.	65-H	230	1150
1	125	Whse.	SK-185	230	350-1050
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450-1000
1	60-100	G.E.	RF-17	230	450-900
1	75	G.E.	CD-1231	230	850
2	75	Cr. Wh.	52HTEFC	230	860
3	50	G.E.	MD-412-AE	230	550
6	40	Rel.BB	285FTEFC	230	500-1500
2	30-40	Whse. D.P.	SK-131-5-BB	230	500-1500
3	(unused) 30	G.E.	CDM-85-BB	230	2200

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
2	2000-2400	G.E.	450	250-300	2300-4600
1	2000	G.E.	514	600	2300-4600
2	1750-2100	G.E.	514	250-300	2300-4600
2	1000	G.E.	720	600	6600-13200
1	750	G.E.	720	125-250	2300-4600
1	500	Whse.	900	125-250	440
1	500	G.E.	900	125-250	440-2300
2	300	G.E.	1200	250	2300
1	300	Whse.	1200	275	440-2300
1	250	Whse.	1200	275	2300
1	200	El. Ma.	1200	250	2300-4600
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	2333	Whse.	OISC	1	13800 x 2300
1	3000	A.C.	OISC	3	33000 x 2300
1	1500	G.E.	auto HT	3	4000/4200-4400
3	1000	G.E.	HVDHJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
1	833	G.E.	H	1	12800 x 460
2	750	G.E.	Pertrad	1	4800 x 83-55
3	500	Kuhl	OISC	1	13200 x 5600
3	500	Kuhl		1	4800-2400 x 240-480
1	300	G.E.	HT	3	4160 x 480/277
3	200	Al. Ch.	OISC	1	2300 x 230-460
3	150	G.E.		1	33000 x 2300, 1000Y

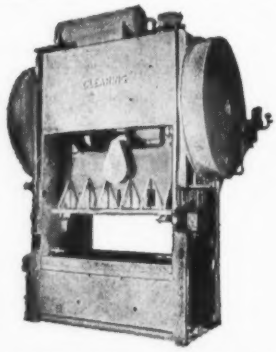
BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

TOTAL OF 17,500-KW IN M.G. SETS

5—3500-KW, 3 Unit, Allis-Chalmers, Motor Generator Sets. Each consisting of:
2—1750-KW, 250/350 Volts parallel, 500/700 Volt series, 514 RPM, 5000 Amp., type HCC, rated continuous at 40 Deg. C. Allis-Chalmers DC Generators with Class B Insulation, separately excited, direct connected in the center to:
1—5000-H, 3730-KW, 13800 Volts (6900 volts), 3 Phase, 60 cycle, 514 RPM, 162 Amps., Allis-Chalmers Synchronous Motor with Class B Insulation, rated continuous at 40 Deg. C. Rise.
Each set equipped with a 40-KW exciter for synchronous motor fields, and a 10-KW exciter for generator fields, both 250-VDC at 514 RPM.
All mounted on a structural steel base approximately 27' long x 11' wide.
These Units are of the very latest type and design—condition excellent—were used only a short time—AC and DC Switchgear available. For any additional information and price, please contact one of the following dealers closest to you:

T. B. MacCabe Company
4300 Clarissa Street, Philadelphia 40, Pa.
Moorhead Electrical Machinery Co.
120 Noblestown Road, Oakdale (Pittsburgh District) Pennsylvania
Brazos Engineering Co., Inc.
P. O. Box 9114, Houston, Texas
Duquesne Electric & Mfg. Co.
6428 Hamilton Avenue, Pittsburgh 6, Pa.

WORLD'S LARGEST STOCK
STAMPING PRESSES
BLISS • CLEARING • CLEVELAND
FERRACUTE • HAMILTON • L & J
NIAGARA • TOLEDO • V & O



SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

JOSEPH HYMAN & SONS
TIOGA, LIVINGSTON & ALMOND STS.
PHILADELPHIA 34, PA. Phone GArfield 3-8700

ARco | **AIR POLUTION CONTROL EQUIPMENT**

GAS • FUME • DUST • WASHING AND SCRUBBING UNITS • ACID-PROOF CONSTRUCTION FOR CORROSIVE CONDITIONS

Inquiries invited from Industrial Sales Representatives

AUTOMOTIVE RUBBER COMPANY INC.
PROCESS EQUIPMENT DIVISION
55 W. 42nd ST. • NEW YORK 36, N. Y.

VIRTUALLY NEW AIR COMPRESSORS

(4) INGERSOLL RAND Model 125M Type 40.2 Stage, Air Cooled with intake filters, 550 CFM. Powered by 125 HP 220/440 Volt 60 cycle, 3 phase, 1200 RPM, Squirrel Cage Induction Motors, with Reduced Voltage Starters.

(2) I-R Aftercoolers 59PL-12 with Condensate Trap.

(1) Air Receiver I-R Size R-9—54" x 14' ASME.

BUILT 1955—USED LESS THAN ONE YEAR
LOCATED IN NEW YORK

LURIA BROTHERS COMPANY, INC.
INDUSTRIAL EQUIPMENT DIVISION
600 Philadelphia Bank Bldg.
Philadelphia 7, Penna.
Rittenhouse 6-7455

One Type 6 4233 CU Hevi-Duty Bill Furnace and Equipment. 125 KW, 440 V 3 Phase 60 Cycle with Inconel Retorts 50" ID x 70" High 2100 F Operating Temperature. New March 1955.

One 240 KW, 3 Phase 60 Cycle, 440 Volt Continuous Special Atmosphere Wire Mesh Belt Conveyor Type Electric Heating Furnace. Inside Clearance 18" High x 4'3" Wide, 2040 F Operating Temperature. New October 1955.

One 3000 CFH Electric Furnace Co. Ammonia Dissociator Unit Complete with Controls. New 1955.

These almost new furnaces are available at considerable savings. For further information write.

BOX G-588
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

Lou F. Kinderman

P. O. BOX 182 NILES, OHIO OLympic 2-9876

FOR SALE

1—Scrap Baler—Galland-Henning—90 Ton Capacity—Bale weight 800#
1—35000# Draw Bench, complete with drive buggy, chain & motors
1—Yoder Type L Rotary Flying Cut-off Machine
1—Cupola, Shell 90" I.D. x 40' complete with accessories
1—Brosius Furncar Charging Machine, gasoline operated
1—10 Ton Morgan O.E.T. Crane, 52'8½" Span, 230 volt DC
1—5 Ton O.E.T. Crane, Floor Operated, 24'9" span, 3/60/220 volt
1—Heroult Electric Arc Melting Furnace, 6 Ton, 5000 KVA Transformer
2—Lee Wilson Bell Type Annealing Furnaces
2—Roll Grinders, one 60" and one 35".
1—Complete set of Hamilton Grinding and Finishing Machines.
1—Lime Kiln, Rotating, 6' x 72', complete with drive and speed reducer.
1—Guide Roller Leveler, 4½" dia rolls x 66" long, 2 high
1—Aetna Roller Leveler, 3¾" dia. rolls x 48" long, complete
1—McKay Roller Leveler, back-up, 2½" dia Rolls, x 60"—17 rolls in all
1—Bar & Rod Mill consisting of 3 stands of 12" x 24", 3-high mill, including spindles, couplings, motor, pinion stand, electrical control.
1—#4½ Vertical Bar Shear, U.E.&F. Co., 28" long knives, approach table & delivery table, 40 HP motor.

We make Electric Furnace Charging Buckets for Top Charge Electric Furnaces

WANTED

1—Blooming Mill, 2 High Reversing, 40" or greater diameter rolls.
1—Slab Mill, 3 High, 36" dia Rolls, minimum of 60" width.
1—Complete Slitting Line 48" or larger, arbors must be 6" or better
1—Crane Runway 800' lg. 25' to crane rail with two cranes—1— 20 Ton O.E.T. Crane, 75' span, 230 volt DC—1—10 Ton O.E.T. Crane, 75' span, 230 volt DC.
Cranes 50 Ton and greater, 60' span and greater, 230 volt DC.
1—Shear, Plate capable of cutting 1" x 48" or larger, mild steel plate.

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

MULTIPLE SPINDLE DRILLS
No. 3 Baush, m.d., 16 x 30" head
3 spindle 28" Cincinnati-Bickford Upright Drill, m.d., No. 4 M.T.
2 spindle Moline Adjustable Rail
3 spindle Rockford 2-12" Gang Drill, m.d.
4 spindle No. 20I-¼" Barnes, H.D., m.d.
6 spindle Model M1613 Pratt & Whitney In Line Vertical Drill
6 spindle W. F. & John Barnes Vertical Drilling Machine, m.d.
No. 924 Barnes Vertical Drilling, Boring, Facing & Reaming Machine

UPRIGHT DRILLS
20" Barnes All Geared Self-Oiling Drill & Tapper, m.d.
20" Cincinnati-Bickford Super-Service Prod. Drill, m.d.
21" Cincinnati-Bickford, single spindle, m.d.
24" Barnes Camel Back, m.d.
25" Cleereman, single spindle, m.d.
No. 2AL Natco Holesteel Vertical, m.d.
No. 2 Colburn Mfg. Type, m.d.
No. 4-48" Defiance Machine Co., Drill, m.d.
No. 150 Baker Single Spindle, m.d.
No. 20I-¼" Barnes Single Sp. Self-Oiling All Geared Drill & Tapper, m.d.
No. 242 Barnes Single Sp. Self-Oiling All Geared Drill & Tapper
No. H4 Barnes Hydram, m.d.
No. 25 Foote-Burt, m.d., Heavy Duty

GEAR SHAPERS
Type Z Fellows Horizontal, m.d.
No. 4 Fellows Enveloping Gear Generator, m.d.
No. 12 Fellows Gear Shaving Machine, m.d., late
No. 6 Fellows, belt drive
No. 7, 7A Fellows Gear Shapers, belted m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 6I Fellows, belted m.d.
No. 6I Fellows, gear box, m.d.
No. 6IA Fellows, m.d., latest type
No. 64S Fellows, m.d.
No. 624A3 Fellows, m.d.
No. 645A Fellows, m.d.
No. 645A3 Fellows, vee belt drive
No. 645Y Fellows, m.d.
No. 70 Cross Deburring Machine, m.d., 1940
No. 72 Fellows H.S. Spur Gear Shaper, m.d.
No. 75 Fellows H.S., m.d.
No. 75A Fellows, H.S. Spur & Helical Gear Shaper, m.d.
No. 712 Fellows, m.d.
No. 50 Cross Clutch Miller, m.d.

GEAR GRINDING MACHINES
6 x 20" Fitchburg Hydraulic Spline & Gear Grinder, m.d.
No. 13LS Fellows Gear Lapper, m.d.
No. 12LS Fellows Gear Lapper, m.d.
SG11 Gear Grinding Machine, m.d., latest
GG19 Gear Grinding Machine, m.d., latest
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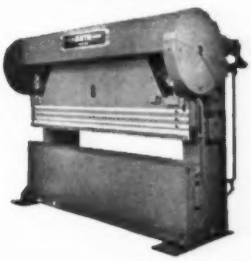

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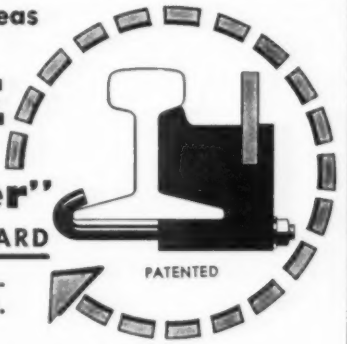

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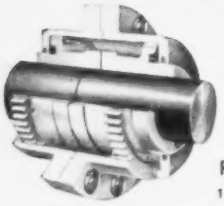

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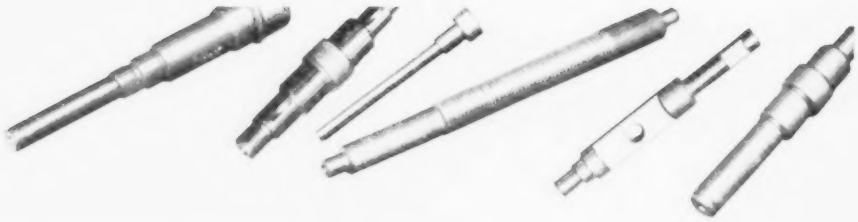

Small-lot production of step shafts more than triples

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The Electro-Cycle's Step Turner attachment enables the automatic turning of five separate diameters in a single setup. The part being machined is completed by using only five stations on the hexagon turret – end stop, center bar end, center support, step turn and then thread. Necking for grinding and thread relief is easily handled from the square turret.

As all shafts are subsequently ground, Hobart holds their machining tolerances to +.005" –.000". These tolerances are easily handled by the versatile Step Turner attachment.

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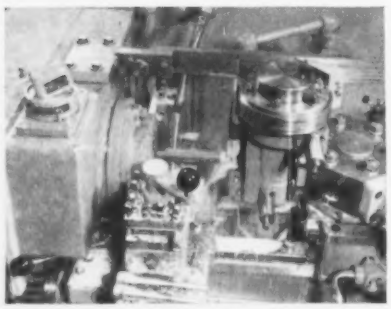
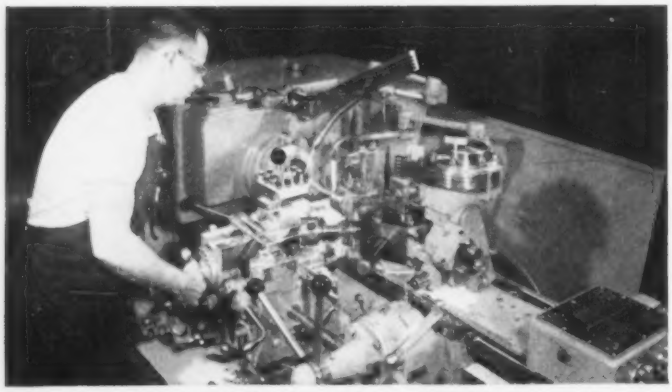
On this versatile Step Turner attachment—once the initial cutter setting has been established—two to four different diameters can be easily selected by simply turning the micrometer dials to desired diameters. If needed, a fifth diameter may be obtained by using the stop screw located at the lower rack's end. Step Turners are available with diameter capacities $\frac{3}{8}$" to $1\frac{1}{2}$", shoulder lengths variable as required, with a total length limitation of 10 inches.





This Electro-Cycle Turret Lathe, shown operating at Hobart Brothers Co., is used for both long and short run production. Automatic, electrical control of all spindle functions greatly reduces machine handling time. They handle a wide variety of jobs in materials from copper and brass up to the toughest alloy steels used today.

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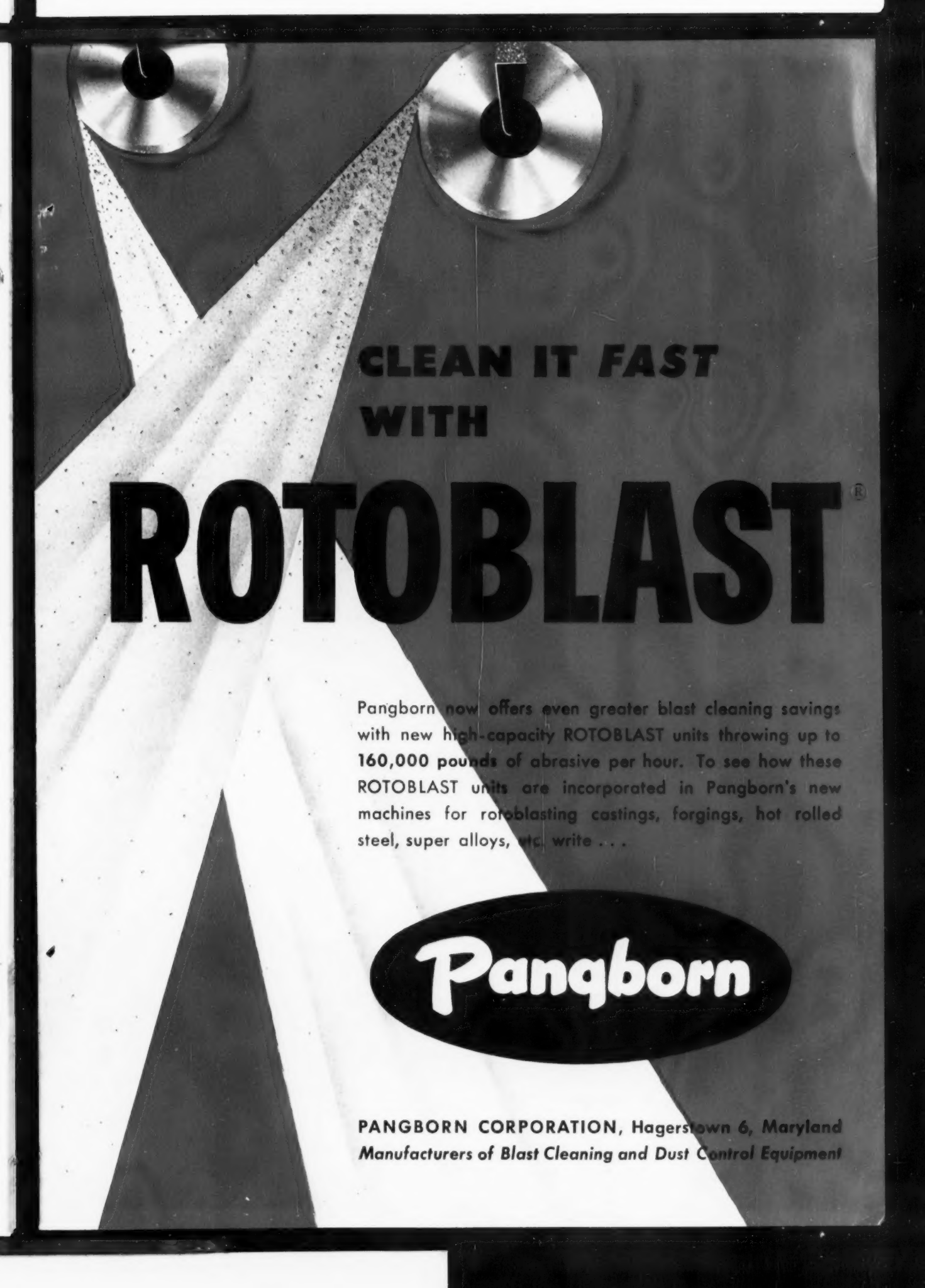
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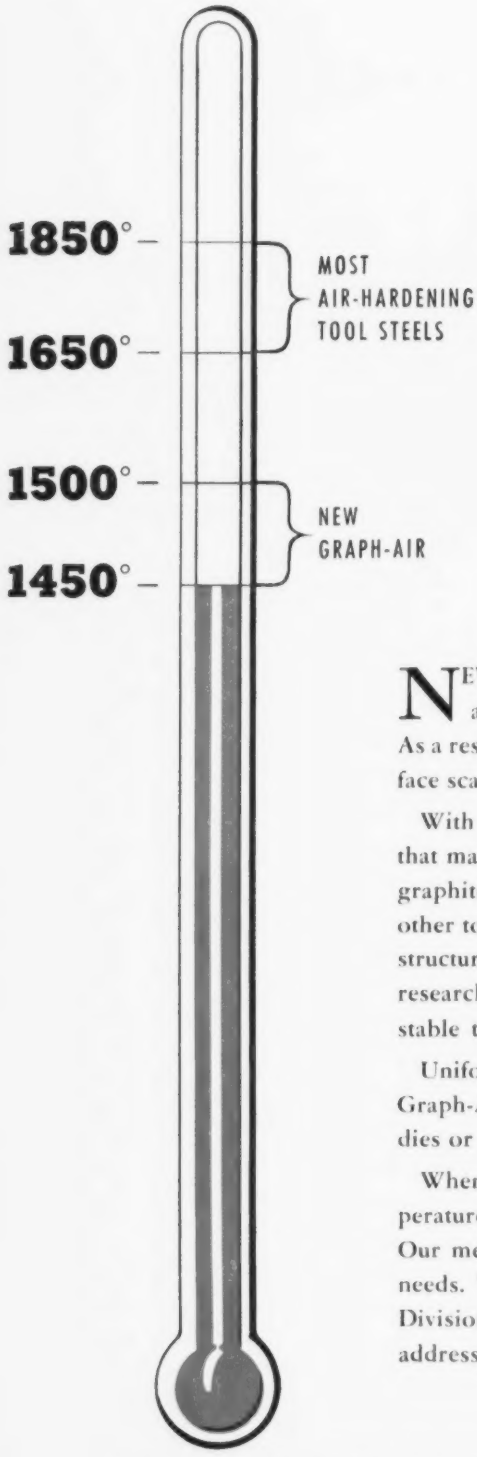

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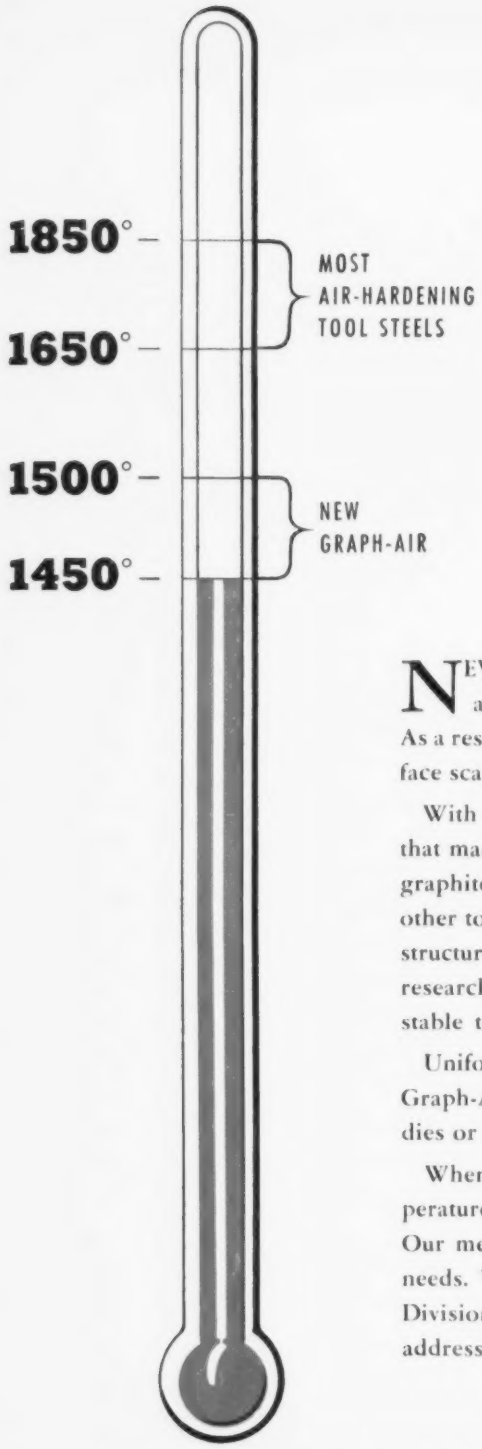

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